

**2013-14 Winter Mark-Selective Recreational Chinook Fisheries  
In Marine Areas 6, 7, 8-1, 8-2, 9, 10, 11 and 12**

**Post-season Report**

**DRAFT**

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## INTRODUCTION

In recent years, abundant runs of hatchery Chinook salmon (*Oncorhynchus tshawytscha*) have been mixed with depressed runs of wild Chinook salmon in the marine environments of the Strait of Juan de Fuca and Puget Sound. Providing recreational anglers with opportunities to harvest abundant hatchery stocks while simultaneously protecting weaker, wild stocks has proven to be a significant conservation and management challenge. The combination of large-scale hatchery marking (i.e., fin clipping) programs and mark-selective harvest regulations makes it possible for anglers to pursue and harvest hatchery Chinook salmon while minimally impacting wild salmon populations. In such “mark-selective fisheries” (MSFs), anglers are generally allowed to retain adipose-fin clipped (“marked”) hatchery fish and are required to release unharmed any unclipped (“unmarked”, predominantly wild) salmon encountered<sup>1</sup>.

Since the Washington Department of Fish and Wildlife (WDFW) implemented the first marine mark-selective Chinook fisheries in Marine Catch Areas 5 and 6 (Strait of Juan de Fuca) in 2003 based on state-tribal agreements (Thiesfeld and Hagen-Breaux 2005a, WDFW 2008a), mark-selective Chinook salmon fishing regulations have been implemented on a pilot basis in multiple Puget Sound Marine Catch Areas during both the summer and winter seasons. As of the close of the summer 2014 fishing season, pilot *summer* Chinook MSFs have occurred in Areas 5 and 6 for twelve consecutive seasons, in Areas 9, 10, 11, and 13 for eight consecutive seasons and in Area 12 for three consecutive seasons. Additionally, pilot *winter* Chinook MSFs have occurred in Areas 8-1 and 8-2 for nine consecutive seasons, in Areas 7, 9 and 10 for seven consecutive seasons, in Areas 11 and 12 for five consecutive seasons and in Area 6 for two seasons<sup>2</sup>.

During the 2013-14 winter season (October 2013 through April 2014), WDFW implemented eight Chinook MSFs in Areas 6, 7, 8-1, 8-2, 9, 10, 11 and 12. The seasons in each of the areas were as follows:

- Area 6 from December 1, 2013 through April 10, 2014;
- Area 7 from December 1, 2013 through April 30, 2014;
- Areas 8-1 and 8-2 from November 1, 2013 through April 30, 2014;
- Area 9 from November 1-30, 2013 and January 16 – April 15, 2014;
- Area 10 from October 1, 2013 through January 31, 2014;
- Area 11 from February 1, 2014 through April 30, 2014; and
- Area 12 from October 1 – December 31, 2013 and February 1 - April 30, 2014.

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<sup>1</sup> The regulations specific to winter Chinook MSFs in Puget Sound Marine Catch Areas allowed for the retention of up to two legal-sized ( $\geq 22$  inches [56 cm]) marked Chinook salmon per day and required the immediate release of all unmarked or sublegal Chinook. Additionally, anglers were: *i*) required to use single-point, barbless hooks while fishing for salmon, *ii*) held to a combined (all salmon species) two-fish daily limit, and *iii*) held to a handling rule that prevented them from bringing unmarked and/or sublegal Chinook aboard their vessels.

<sup>2</sup> For information regarding effort, harvest and impacts estimates related to these fisheries, see the references listed at the end of this report, or visit: [http://wdfw.wa.gov/publications/search.php?Cat=Fishing / Shellfishing&SubCat=Selective Fishing](http://wdfw.wa.gov/publications/search.php?Cat=Fishing/Shellfishing&SubCat=Selective%20Fishing). The 2014 summer mark-selective fisheries report is currently in preparation.

Consistent with the 2004 (and 2010 update) Puget Sound Chinook Harvest Management Plan (Puget Sound Indian Tribes and WDFW 2004 and 2010), a key goal of implementing each of these Chinook MSFs has been to provide meaningful opportunity to the recreational angling public while minimally impacting ESA-listed Puget Sound Chinook salmon.

### Comprehensive Sampling and Monitoring Program

WDFW's Puget Sound Sampling Unit (PSSU) was tasked with implementing a comprehensive sampling and monitoring program in Areas 6, 7, 8-1, 8-2, 9,10,11 and 12 to collect the data needed to evaluate each Chinook MSF and its impact on unmarked salmon. Through state-tribal agreement (WDFW and NWIFC 2013), we developed area-specific sampling plans consisting of several comprehensive and complementary sampling components, including dockside creel sampling, test fishing, on-water or aerial effort surveys, and angler-completed voluntary trip reports (VTRs). We tailored area-specific sampling plans so that we could reliably estimate the following critical parameters needed for evaluating MSFs:

- i) the mark rate of the targeted Chinook population
- ii) the total number of Chinook salmon harvested (by size [legal or sublegal] and mark-status [marked or unmarked] group)
- iii) the total number of Chinook salmon released (by size and mark-status group)
- iv) the coded-wire tag (CWT) and/or DNA-based stock composition of marked and unmarked Chinook mortalities<sup>3</sup>
- v) the total mortality of marked and unmarked double index tag (DIT) CWT stocks

In addition, we acquired and analyzed relevant data characterizing other aspects of the fisheries, including descriptors of fishing effort, fishing success (catch [landed Chinook] per unit effort), the length composition of encountered Chinook, and the overall intensity of our sampling efforts.

### Reporting Efficiencies

In July 2010, technical staffs from the WDFW Puget Sound Sampling Unit, Northwest Indian Fisheries Commission (NWIFC), and Puget Sound Treaty Tribes met to discuss potential reporting efficiencies in WDFW's Chinook MSF post-season reports. NWIFC and tribal representatives had initiated the idea for such a meeting, considering that WDFW had been submitting a separate post-season report for each area and season (since 2003) to the co-managers, resulting in redundancies between individual reports, particularly in the Methods section. Also, over the years we kept adding sections to the selective fishery annual reports, in response to individual tribal co-manager requests, and sustained those additions in each future report, resulting in ever-lengthening post-season reports. From both the WDFW and tribal technical perspectives, we needed to prioritize the most essential reporting elements and achieve efficiencies to streamline the selective fishery reporting work load.

Thus, at the July 2010 meeting the WDFW and tribal staffs worked on prioritizing the most essential elements (i.e., tables, figures, and appendices) needed in WDFW's annual post-season

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<sup>3</sup> Though the necessary tissue samples have been collected, DNA-based estimates of stock composition are presently unavailable for Puget Sound/Strait of Juan de Fuca mark-selective fisheries. In the present report, methods for producing CWT-based (unexpanded) estimates of the stock composition of marked Chinook harvest are provided.

selective fishery reports in an effort to define reporting efficiencies. Based on these decisions (details available in a WDFW memo dated August 16, 2010 summarizing the July 2010 meeting), we began implementing reporting efficiencies starting with the 2009-10 winter Chinook MSF post-season report and continuing thereafter.

At the July 2010 meeting we also agreed that a key efficiency in the annual reporting process would be for WDFW staff to produce a centralized Methods Report. The Methods Report would be a stand-alone document that includes the details of each area's Chinook MSF study design (for both winter and summer fisheries), sampling procedures, data analysis methods, and all equations used to generate estimates and variances. Thus, we refer the reader to our Methods Report (WDFW 2012a) for detailed descriptions of the diverse study designs and protocols used to monitor and evaluate the Chinook MSFs in Areas 5, 6, 7, 8-1, 8-2, 9, 10, 11, 12 and 13.

In the following pages, we report the results generated through our monitoring activities during the 2013-14 winter Chinook MSFs. We report results based on our more efficient reporting format agreed-to between state and tribal technical representatives, in which we focus on presenting data tables and figures rather than interpretive text (unless text is needed to specify noteworthy in-season adjustments or other circumstances unique to the particular season). We present 2013-14 winter Chinook MSF results in separate chapters (1 through 7) by area, and within each chapter the data are presented in a series of tables and figures generally according to the following sequence: *i*) estimates of fishery characteristics obtained from the dockside creel survey data, including catch and effort total estimates, Chinook length-frequency data, and CWT recovery results; *ii*) results from our recreational test fishery (where applicable); *iii*) results from our VTR collection efforts; *iv*) total mortality estimates of marked and unmarked DIT CWT stocks by hatchery and brood year; *v*) total fishery Chinook encounters and impacts—estimated based on creel survey and test fishery or VTR data—which we compare with pre-season expectations (based on Fishery Regulation Assessment Model [FRAM] predictions); *vi*) sample rate information based on dockside sampling of harvested Chinook; and *vii*) historical Chinook encounters estimates for each area's winter Chinook MSF.

## RESULTS

### 1) Marine Area 6 Winter Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a winter Chinook MSF in Marine Area 6 for the second time from December 1, 2013 through April 10, 2014. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 6 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, aerial effort surveys and collection of VTRs from the angling public. **Table 1.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 6 winter Chinook MSF from December 1, 2013 through April 10, 2014. In addition to the major components of the results described previously (page 3), we present aerial survey and dockside data used to estimate the sample fraction in Area 6 (see WDFW 2012a, *Aerial-Access Design*). The four sites included in the Area 6 dockside sample frame are John Wayne Marina, Port Angeles Boat Haven, Ediz Hook and Coronet Ramp, which are assumed to be the highest-use access sites for Area 6 anglers. The Olympic Peninsula Derby took place from February 15-17 over portions of Marine Areas 6 and 9. Total derby effort was allocated to each Marine Area using the proportion of effort that occurred in each area based on dockside sampling efforts at designated weigh-in stations during the derby. Total catch by Marine Area was reported by the derby.

**Table 1.1** Sampling/estimation details on target parameters associated with the overall Area 6 Chinook MSF monitoring program.

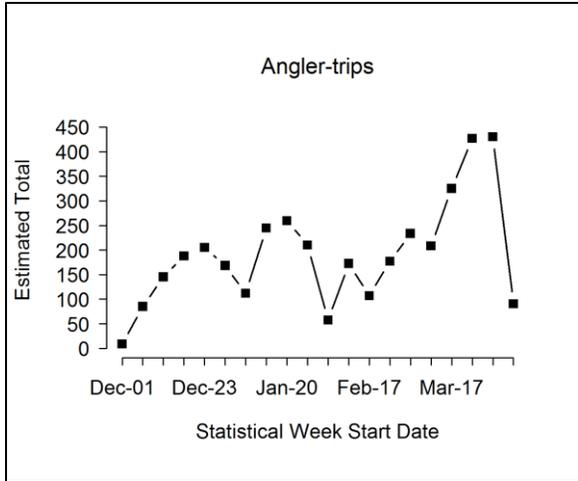
Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum we sampled $n=2$ days out of $N=3$ available weekend days per week.
Aerial Surveys	Fraction of Area 6 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, $f_{ij}$ ).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Season	The sample fraction was calculated for individual aerial survey dates (see <b>Table 1.11</b> ; $n=7$ surveys conducted out of $N=131$ days available in the season). Season-wide sample fraction was calculated as the average sample fraction over the 7 individual aerial surveys.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., Coho) that the angler may record on the VTR form	Fish encounter	Season	VTR data ( <b>Table 1.5</b> ) were used to estimate the size/mark-status proportions (LM = 64%, LU = 10%, SM = 21%, SU = 4%) needed to produce encounter and mortality estimates.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

<sup>1</sup>The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

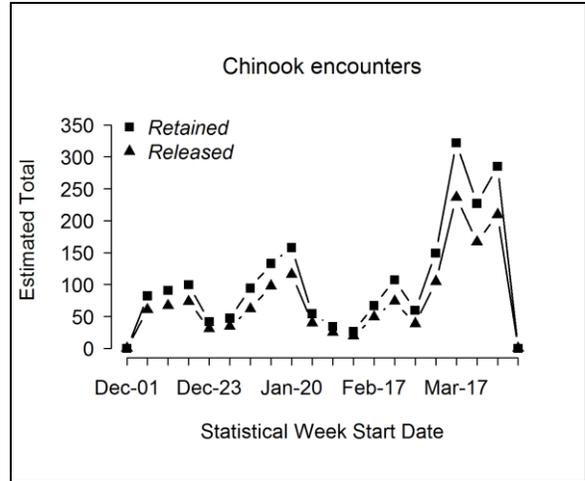
<sup>2</sup>Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

**Table 1.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2013-14 winter Chinook MSF in Marine Area 6. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

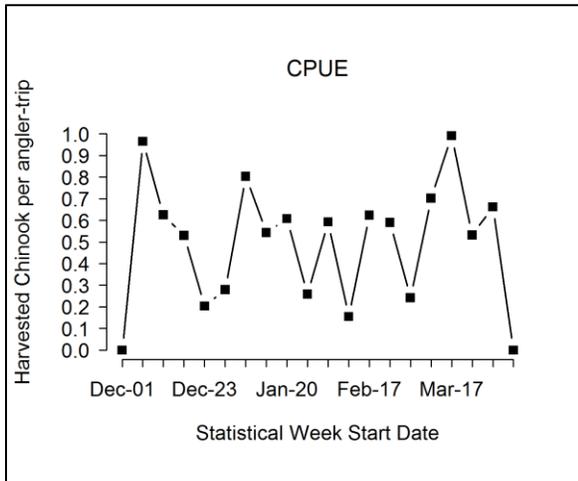
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Dec	48	1-Dec	1-Dec	3	9	0	0	0	0	0
	49	2-Dec	8-Dec	46	85	82	0	40	21	143
	50	9-Dec	15-Dec	81	145	91	0	44	23	157
	51	16-Dec	22-Dec	103	188	99	0	48	25	173
	52	23-Dec	29-Dec	105	205	42	0	20	10	72
Jan	53/1	30-Dec	5-Jan	88	168	47	0	23	12	82
	2	6-Jan	12-Jan	75	112	90	4	43	18	156
	3	13-Jan	19-Jan	139	245	133	0	64	33	231
	4	20-Jan	26-Jan	165	259	158	0	76	40	273
	5	27-Jan	2-Feb	114	210	54	0	26	14	94
Feb	6	3-Feb	9-Feb	37	57	34	0	16	9	59
	7	10-Feb	16-Feb	68	172	27	0	13	7	46
	8	17-Feb	23-Feb	64	107	67	0	32	17	116
	9	24-Feb	2-Mar	101	177	104	3	50	23	181
Mar	10	3-Mar	9-Mar	131	234	57	3	27	11	98
	11	10-Mar	16-Mar	117	208	146	3	71	34	254
	12	17-Mar	23-Mar	179	325	322	0	156	81	559
	13	24-Mar	30-Mar	231	427	227	0	110	57	394
Apr	14	31-Mar	6-Apr	238	430	285	0	138	72	494
	15	7-Apr	10-Apr	53	91	0	0	0	0	0
<b>Season Sub-Total:</b>				2,137	3,855	2,064	13	999	506	3,582
Olympic Peninsula Derby; Feb 15-17				213	468	124	0	60	31	215
<b>Season Total:</b>				<b>2,350</b>	<b>4,323</b>	<b>2,188</b>	<b>13</b>	<b>1,059</b>	<b>537</b>	<b>3,797</b>
<b>Variance:</b>				11,148	42,914	36,783	35	96,190	3,665	120,376
<b>SE:</b>				106	207	192	6	310	61	347
<b>CV (%):</b>				4	5	9	46	29	11	9
<b>95% CI:</b>				2,143 - 2,557	3,917 - 4,729	1,812 - 2,564	1 - 25	451 - 1,667	418 - 655	3,117 - 4,477



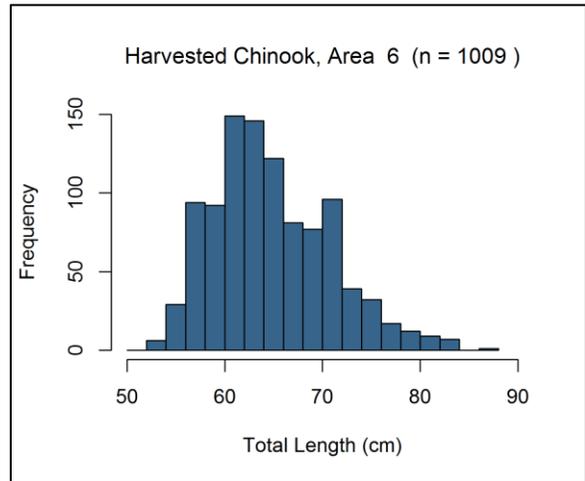
**Figure 1.1** Temporal patterns in fishing effort during the 2013-14 winter Chinook MSF in Marine Area 6.



**Figure 1.3** Temporal patterns in Chinook encounters (number retained and released) during the 2013-14 winter Chinook MSF in Marine Area 6.



**Figure 1.2** Temporal patterns in CPUE (number of Chinook landed per angler trip) during the 2013-14 winter Chinook MSF in Marine Area 6.



**Figure 1.4** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2013-14 winter Chinook MSF in Marine Area 6.

**Table 1.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2013-14 winter Chinook MSF in Marine Area 6.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	976	33	1,009
Unmarked	4	0	4
<b>Total</b>	<b>980</b>	<b>33</b>	<b>1,013</b>

**Table 1.4** Summary of CWTs recovered from Chinook salmon harvested during the 2013-14 winter Chinook MSF in Marine Area 6. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
B.C. (5.8%)	Fraser-Thompson River (1.9%)	Chilliwack R	Chilliwack River H	2 (1.9%)	2
	Georgia Strait (3.8%)	Cowichan R	Cowichan River H	4 (3.8%)	0
WA (88.5%)	N Washington (16.3%)	East Sound Bay (SAN)	Glenwood Springs	2 (1.9%)	0
		Friday Cr 03.0017	Samish H	9 (8.7%)	2
		Nooksack R -NF 01.0120	Kendall Cr H	2 (1.9%)	2
		Boyd Cr 01.0490	Kendall Cr H	4 (3.8%)	0
	Hood Canal (18.3%)	Finch Cr 16.0222	Hoodsport H	5 (4.8%)	0
		Purdy Cr 16.0005	George Adams H	14 (13.5%)	11
	N Puget Sound (20.2%)	Whitehorse Springs	Stillaguamish H	12 (11.5%)	0
		Wallace R 07.0940	Wallace R H	8 (7.7%)	2
		Tulalip Cr 07.0001	Bernie Gobin H	1 (1%)	0
	Skagit River (4.8%)	Cascade R 03.1411	Marblemount H	5 (4.8%)	3
	Mid Puget Sound (18.3%)	Big Soos Cr 09.0072	Soos Creek H	1 (1%)	1
		Gorst Cr 15.0216	Gorst Rearing Pnd	6 (5.8%)	0
		Grovers Cr Hatchery	Grovers Cr H	7 (6.7%)	1
		White R 10.0031	White River H	1 (1%)	0
		Icy Cr 09.0125	Icy Cr H	4 (3.8%)	0
	S Puget Sound (10.6%)	Clear Cr 11.0013C	Clear Creek H	3 (2.9%)	3
		Minter Cr 15.0048	Minter Cr H	8 (7.7%)	0
Col River (5.8%)	Upper Columbia R (1%)	Wenatchee R 45.0030	Dryden Pond	1 (1%)	0
	Central Columbia R (1.9%)	Spring Cr 29.0159	Spring Cr NFH	1 (1%)	1
		Umatilla R	Bonneville H	1 (1%)	1
	Lower Columbia R (2.9%)	Big Cr (Lower Col R)	Big Cr H	1 (1%)	1
		Santiam R S Fk	South Santiam H	1 (1%)	0
McKenzie R 1		McKenzie H	1 (1%)	0	
<b>Total</b>				<b>104</b>	<b>30</b>

**Table 1.5** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2013-14 winter Chinook MSF in Marine Area 6. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	249 1-trip VTRs, 418 Angler Trips	562	89	188	38	877	0.86	0.86
Size/mark-status composition:		0.64	0.10	0.21	0.04			
Variance:		(0.00026)	(0.00010)	(0.00019)	(0.00005)			

**Table 1.6** Summary of season-wide fishery impact estimates for the 2013-14 winter Chinook MSF in Marine Area 6. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

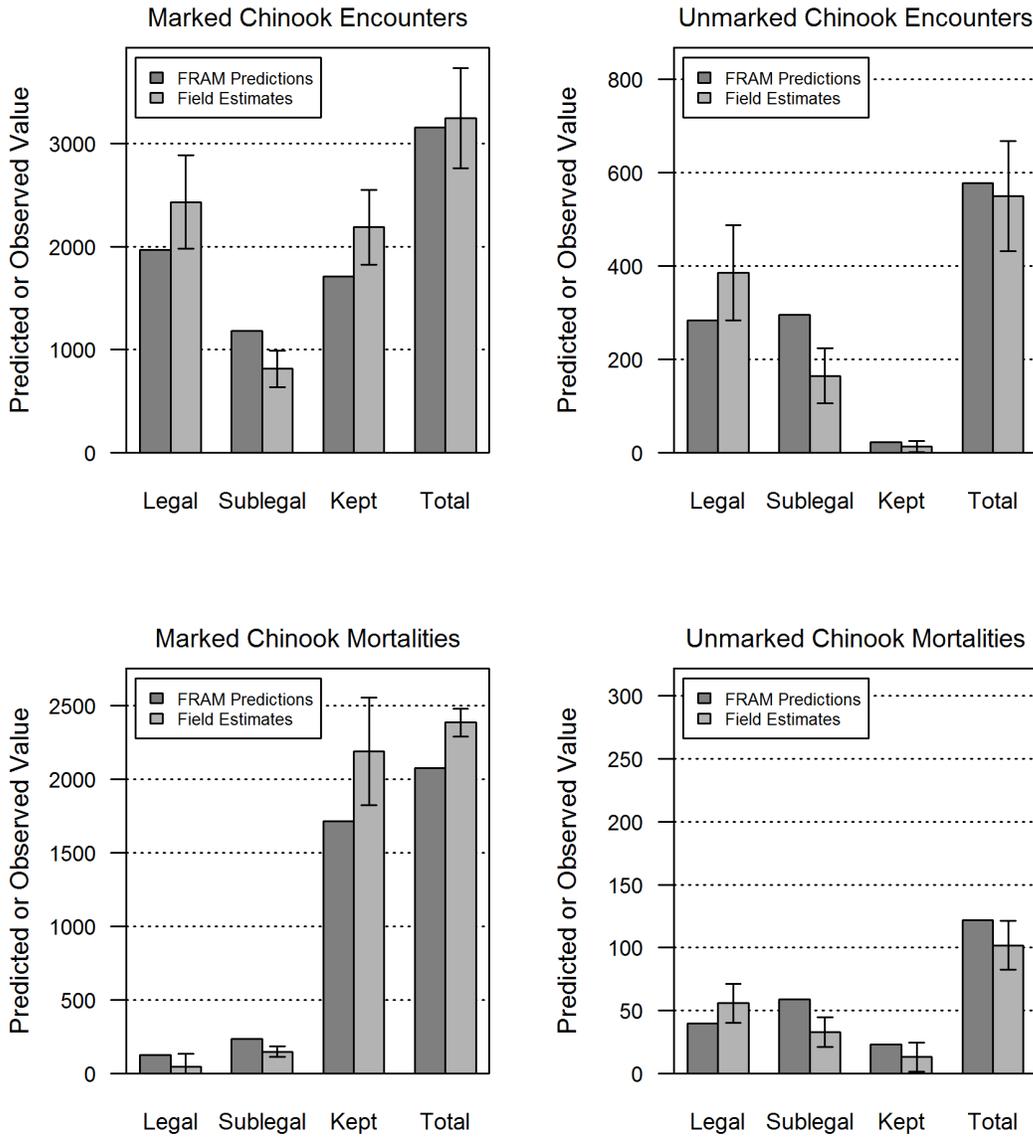
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	2,433	2,117	316	47	2,164	36,523	191	1,790 - 2,539	9
Legal UM	385	13	372	56	69	97	10	50 - 88	14
Sublegal AD	814	72	742	148	220	510	23	176 - 264	10
Sublegal UM	165	0	165	33	33	36	6	21 - 45	18
<b>Total</b>	<b>3,797</b>	<b>2,201</b>	<b>1,595</b>	<b>285</b>	<b>2,486</b>	<b>37,166</b>	<b>193</b>	<b>2,108 - 2,864</b>	<b>8</b>

**Table 1.7** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters for the 2013-14 winter Chinook MSF in Marine Area 6. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	578	283	295	23
	AD	3,154	1,969	1,185	1,713
	Total	3,732	2,252	1,480	1,736
	% Marked	85	87	80	99
Estimated (Creel) Encounters	UM	550	385	165	13
	AD	3,247	2,433	814	2,188
	Total	3,797	2,818	978	2,201
	% Marked	86	86	83	99

**Table 1.8** Comparison of modeled (FRAM model run 1213) and estimated total Chinook mortalities for the 2013-14 winter Chinook MSF in Marine Area 6. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	122	2,074	2,196	102	2,384	2,486
Released Legal	40	124	164	56	47	103
Released Sublegal	59	237	296	33	148	181
Landed Only	23	1,713	1,736	13	2,188	2,201



**Figure 1.5** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters and mortalities for the 2013-14 winter Chinook MSF in Marine Area 6. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 1.9** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2013-14 winter Chinook MSF in Marine Area 6. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Big Creek Hatchery	2011	1	2.2	2.55	0.7	0.1	0.003	0.05
Bonneville Hatchery	2010	1	2.2	2.55	2.4	0.2	0.031	0.18
Clear Creek Hatchery	2010	3	6.5	7.65	6.7	0.7	0.081	0.49
George Adams Hatchery	2010	11	23.9	28.04	24.3	2.4	0.291	1.79
Grovers Creek Hatchery	2010	1	2.2	2.55	2.2	0.2	0.025	0.16
Chilliwack River Hatchery	2011	2	4.3	5.10	2.2	0.2	0.013	0.16
Kendall Creek Hatchery	2010	2	4.3	5.10	4.2	0.4	0.048	0.31
Marblemount Hatchery	2010	3	6.5	7.65	7.0	0.7	0.089	0.52
Samish Hatchery	2010	2	4.3	5.10	4.5	0.5	0.055	0.33
Soos Creek Hatchery	2010	1	2.2	2.55	2.2	0.2	0.027	0.16
Spring Creek NFH	2010	1	2.2	2.55	2.2	0.2	0.025	0.16
Wallace Hatchery	2010	2	4.3	5.10	4.4	0.4	0.052	0.32
<b>Total</b>		<b>30</b>	<b>65.2</b>	<b>76.48</b>	<b>63.1</b>	<b>6.3</b>	<b>0.739</b>	<b>4.63</b>

**Table 1.10** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) for the 2013-14 winter Chinook MSF in Marine Area 6. AD = marked (adipose-clipped), UM = unmarked.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
December	48 - 52	1 Dec - 29 Dec	314	0	314	124	0	124	39.5
January	53/1 - 5	30 Dec - 2 Feb	482	4	486	209	2	211	43.4
February	6 - 9	3 Feb - 2 Mar	356	3	359	186	0	186	51.9
March	10 - 13	3 Mar - 30 Mar	752	6	757	281	2	283	37.4
April	14 - 15	31 Mar - 10 Apr	285	0	285	209	0	209	73.3
<b>Season Total</b>			<b>2,188</b>	<b>13</b>	<b>2,201</b>	<b>1,009</b>	<b>4</b>	<b>1,013</b>	<b>46.0</b>

<sup>1</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWTs, from all sites sampled during the winter 2013-14 Area 6 Chinook MSF (the four sample-frame sites included in the creel estimates, derby samples, and the fish sampled as part of baseline sampling in Area 6).

**Table 1.11** Fishery-total estimates of retained and released salmon (*other than Chinook*) during the 2013-14 winter Chinook MSF in Marine Area 6. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status.

Week	Start Date	End Date	Retained Salmon		Released Salmon			
			Coho AD	Coho UM	Coho AD	Coho UM	Coho UK	Unk Salmon
48	1-Dec	1-Dec	0	0	0	0	0	0
49	2-Dec	8-Dec	0	0	0	0	0	9
50	9-Dec	15-Dec	0	0	0	3	2	75
51	16-Dec	22-Dec	0	0	0	0	0	25
52	23-Dec	29-Dec	2	7	7	0	94	6
53/1	30-Dec	5-Jan	0	0	18	7	0	1
2	6-Jan	12-Jan	0	0	26	0	0	4
3	13-Jan	19-Jan	0	0	0	0	15	34
4	20-Jan	26-Jan	0	0	13	8	15	52
5	27-Jan	2-Feb	0	0	0	0	98	0
6	3-Feb	9-Feb	0	0	0	0	0	0
7	10-Feb	16-Feb	0	0	0	0	0	77
8	17-Feb	23-Feb	0	0	0	0	0	0
9	24-Feb	2-Mar	0	0	0	0	0	0
10	3-Mar	9-Mar	0	0	0	2	0	0
11	10-Mar	16-Mar	0	0	0	0	0	0
12	17-Mar	23-Mar	0	0	0	0	0	0
13	24-Mar	30-Mar	0	0	0	0	0	0
14	31-Mar	6-Apr	0	0	0	0	0	0
15	7-Apr	10-Apr	0	0	0	0	0	0
<b>Season Total:</b>			<b>2</b>	<b>7</b>	<b>64</b>	<b>20</b>	<b>223</b>	<b>283</b>
<b>Variance:</b>			2	18	1,001	41	5,520	3,496
<b>Standard Error:</b>			1	4	32	6	74	59
<b>CV (%):</b>			58	58	49	32	33	21
<b>95% CI:</b>			0 - 5	0 - 15	2 - 126	7 - 32	77 - 368	168 - 399

**Table 1.12** Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the four-site sample frame during the 2013-14 winter Chinook MSF in Marine Area 6. See Methods Report (WDFW 2012a) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, $f_{ij}$
		Start Time	End Time	Total Boats, $m_{ij}$	Sampled Boats	Active Boats, $X_{ij}$	Total Boats, $Sy_{ijk}$	
4-Dec	Weekday	10:27	11:09	6	10	4	15	0.667
31-Jan	Weekend	11:29	12:10	15	13	9	22	0.600
1-Feb	Weekend	10:23	11:11	42	33	27	51	0.643
21-Feb	Weekend	10:05	10:55	5	5	4	6	0.800
28-Feb	Weekend	10:46	11:34	14	13	9	20	0.643
15-Mar	Weekend	10:28	11:14	14	14	10	20	0.714
22-Mar	Weekend	9:59	10:54	30	24	21	34	0.700
<b>Totals:</b>				<b>126</b>	<b>112</b>	<b>84</b>	<b>168</b>	
Mean:				18	16	12	24	0.681
St Dev:				13.4	9.4	8.7	14.7	0.065
CV(%):				74.3%	58.9%	72.6%	60.9%	9.5%

**Table 1.13** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 6 Winter Chinook MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Area	Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
6	Dec 1, 2012 - Apr 10, 2013	4,916	1,395	21	14	0	209	385	315	135	2,474
6	Dec 1, 2013 - Apr 10, 2014	4,323	2,117	13	72	0	316	372	742	165	3,797

## 2) Marine Area 7 Winter Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a seventh consecutive winter Chinook MSF in Marine Area 7 from December 1, 2013 through April 30, 2014. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 7 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, aerial effort surveys, test fishing and collection of VTRs from the angling public. **Table 2.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 7 winter Chinook MSF from December 1, 2013 through April 30, 2014. In addition to the major components of the results described previously (page 3), we present aerial survey and dockside data used to estimate the sample fraction in Area 7 (see WDFW 2012a, *Aerial-Access Design*). The three sites included in the Area 7 dockside sample frame are Washington Park Ramp, Bellingham Ramp and Coronet Ramp, which are assumed to be the highest-use access sites for Area 7 anglers. Due to safety concerns and in an effort to improve sampling efficiencies, we modified the flight path of Area 7 aerial surveys to exclude the area of open water north of Patos Island beginning in December 2012. An examination of flight survey data from previous years suggests that approximately 5% of the boats observed during flights were located in this area. Given the limited amount of effort occurring in this area we assumed the effect on effort and harvest estimates would be negligible. Beginning on February 24, 2014, the daily limit of marked Chinook was reduced to one fish (from two) per angler due to higher than projected legal encounters.

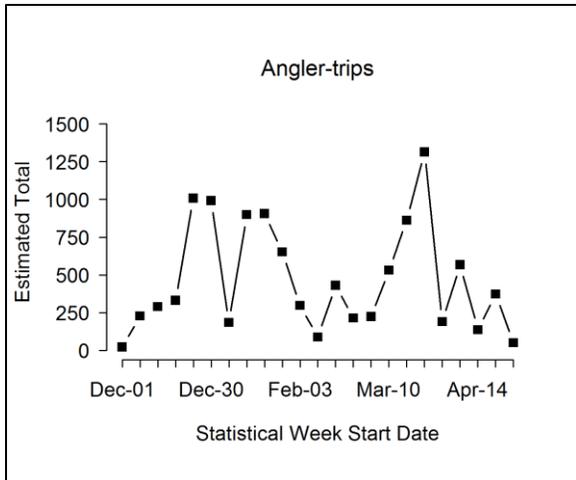
**Table 2.1** Sampling/estimation details on target parameters associated with the overall Area 7 Chinook MSF monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum we sampled $n=2$ days out of $N=3$ available weekend days per week.
Aerial Surveys	Fraction of Area 7 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, $f_{ij}$ ).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Season	The sample fraction was calculated for individual aerial survey dates (see <b>Table 2.13</b> ; $n=14$ surveys conducted out of $N=151$ days available in the season). Season-wide sample fraction was calculated as the average sample fraction over the 14 individual aerial surveys.
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season	We used the test fishery data only to estimate the size/mark-status proportions (LM = 55%, LU = 23%, SM = 15%, SU = 7%; <b>Table 2.5</b> ) needed to produce encounter and mortality estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., Coho) that the angler may record on the VTR form	Fish encounter	Season	VTR data ( <b>Table 2.6</b> ) were not used for impact estimation steps due to the assumed higher data quality and sufficient sample size of test fishery data. See comment in row above.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

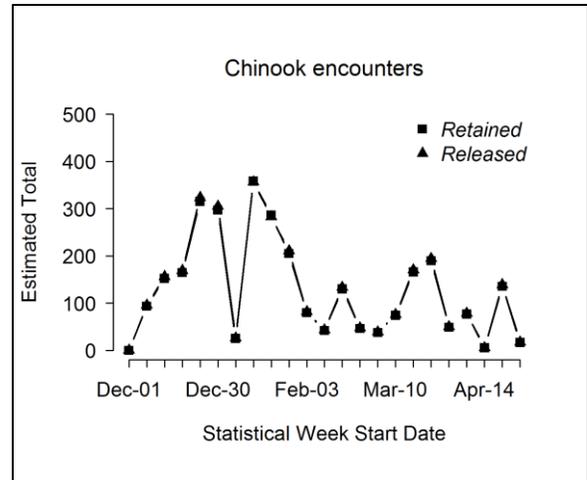
<sup>1</sup>The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.<sup>2</sup>Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

**Table 2.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2013-14 winter Chinook MSF in Marine Area 7. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

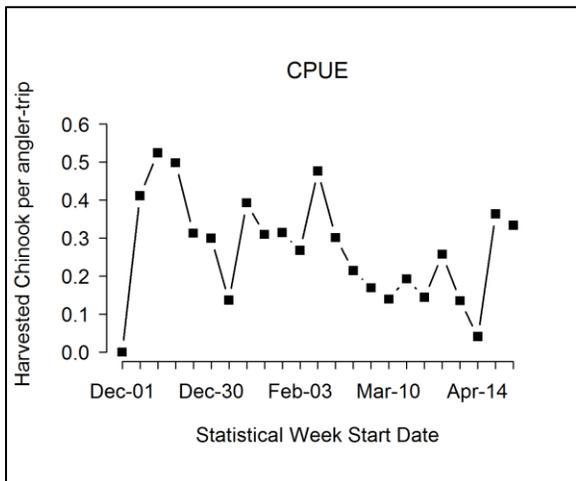
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Dec	48	1-Dec	1-Dec	8	22	0	0	0	0	0
	49	2-Dec	8-Dec	116	227	93	0	39	57	189
	50	9-Dec	15-Dec	178	290	152	0	64	92	308
	51	16-Dec	22-Dec	187	330	164	0	69	100	333
	52	23-Dec	29-Dec	471	1,008	315	0	132	192	639
Jan	53/1	30-Dec	5-Jan	452	992	297	0	124	181	602
	2	6-Jan	12-Jan	100	184	25	0	11	15	51
	3	13-Jan	19-Jan	456	899	353	6	148	209	715
	4	20-Jan	26-Jan	460	906	280	6	117	165	568
	5	27-Jan	2-Feb	332	652	205	0	86	125	415
Feb	6	3-Feb	9-Feb	152	297	79	0	33	48	161
	7	10-Feb	16-Feb	46	88	42	0	18	25	85
	8	17-Feb	23-Feb	222	431	130	0	54	79	263
	9	24-Feb	2-Mar	109	215	46	0	19	28	93
Mar	10	3-Mar	9-Mar	130	223	38	0	16	23	76
	11	10-Mar	16-Mar	276	531	74	0	31	45	150
	12	17-Mar	23-Mar	439	862	166	0	69	101	336
	13	24-Mar	30-Mar	586	1,315	189	0	79	115	384
Apr	14	31-Mar	6-Apr	100	190	49	0	20	30	99
	15	7-Apr	13-Apr	279	567	77	0	32	47	155
	16	14-Apr	20-Apr	78	137	6	0	2	3	11
	17	21-Apr	27-Apr	191	372	135	0	57	82	274
	18	28-Apr	30-Apr	33	50	17	0	7	10	34
<b>Season Sub-Total:</b>				5,401	10,788	2,932	11	1,228	1,771	5,942
Resurrection Derby; Dec 6-7, 2013				85	250	185	0	77	112	375
Roche Harbor Derby; Feb 7-8, 2014				100	344	172	0	72	105	349
Anacortes Derby; Mar 29-30, 2014				400	1,000	156	0	65	95	316
<b>Season Total:</b>				5,986	12,382	3,445	11	1,443	2,083	6,982
<b>Variance:</b>				188,576	827,882	70,647	99	345,507	99,465	524,217
<b>SE:</b>				434	910	266	10	588	315	724
<b>CV (%):</b>				7	7	8	89	41	15	10
<b>95% CI:</b>				5,134 - 6,837	10,599 - 14,166	2,924 - 3,966	0 - 31	291 - 2,595	1,465 - 2,702	5,563 - 8,401



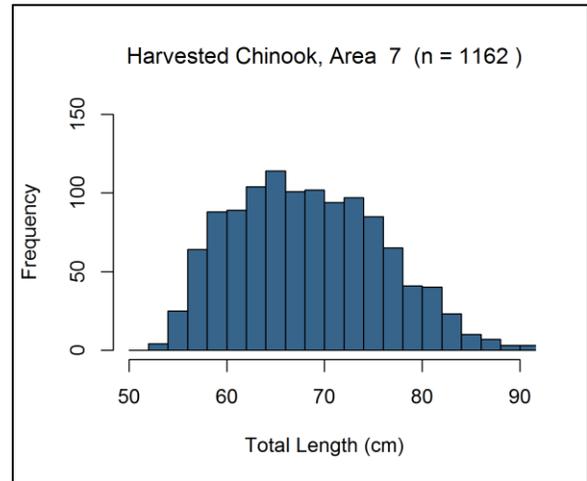
**Figure 2.1** Temporal patterns in fishing effort during the 2013-14 winter Chinook MSF in Marine Area 7.



**Figure 2.3** Temporal patterns in Chinook encounters (number retained and released) during the 2013-14 winter Chinook MSF in Marine Area 7.



**Figure 2.2** Temporal patterns in CPUE (number of Chinook landed per angler trip) during the 2013-14 winter Chinook MSF in Marine Area 7.



**Figure 2.4** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2013-14 winter Chinook MSF in Marine Area 7.

**Table 2.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2013-14 winter Chinook MSF in Marine Area 7.

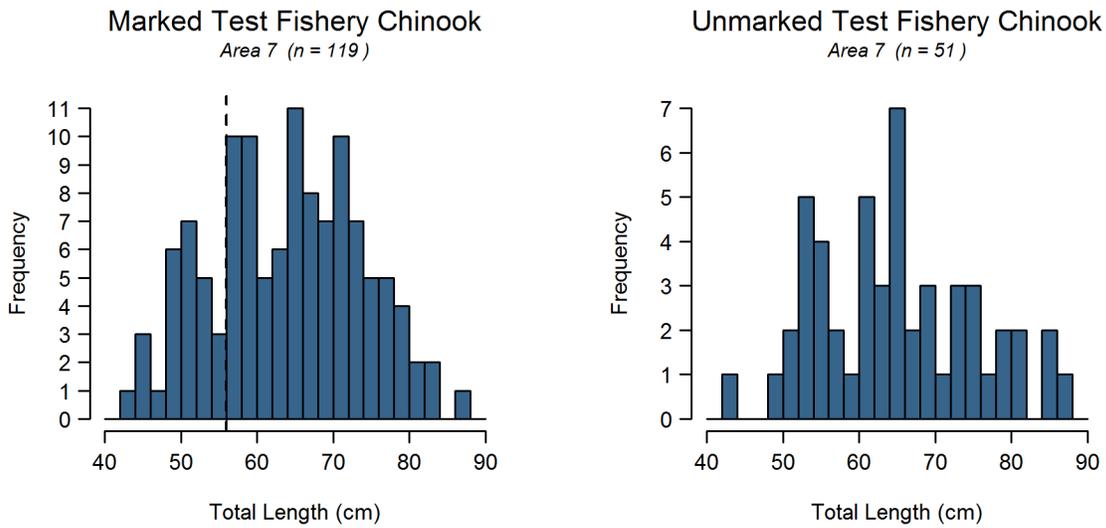
Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	1,133	29	1,162
Unmarked	6	0	6
<b>Total</b>	<b>1,139</b>	<b>29</b>	<b>1,168</b>

**Table 2.4** Summary of CWTs recovered from Chinook salmon harvested during the 2013-14 winter Chinook MSF in Marine Area 7. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
B.C. (13.3%)	Fraser-Thompson River (6.2%)	Chilliwack R	Chilliwack River H	5 (3.9%)	5
		Harrison R	Chehalis River H	3 (2.3%)	0
	Georgia Strait (7%)	Cowichan R	Cowichan River H	7 (5.5%)	0
		Big Qualicum R	Big Qualicum River	2 (1.6%)	0
WA (85.2%)	N Washington (14.1%)	Friday Cr 03.0017	Samish H	6 (4.7%)	4
		Boyd Cr 01.0490	Kendall Cr H	8 (6.2%)	0
		East Sound Bay (SAN)	Glenwood Springs	3 (2.3%)	0
		Nooksack R	Kendall Cr H	1 (0.8%)	1
	Hood Canal (7.8%)	Finch Cr 16.0222	Hoodsport H	4 (3.1%)	0
		Purdy Cr 16.0005	George Adams H	6 (4.7%)	3
	N Puget Sound (24.2%)	May Cr 07.0943	Wallace R H	1 (0.8%)	0
		Walace R 07.0940	Wallace R H	10 (7.8%)	2
		Tulalip Cr 07.0001	Bernie Gobin H	5 (3.9%)	3
		Whitehorse Springs	Stillaguamish H	15 (11.7%)	0
	Skagit River (21.9%)	Co Line PD2 03.1853B	Marblemount H	1 (0.8%)	0
		Cascade R 03.1411	Marblemount H	27 (21.1%)	11
	Mid Puget Sound (11.7%)	Big Soos Cr 09.0072	Soos Creek H	3 (2.3%)	3
		Grovers Cr Hatchery	Grovers Cr H	6 (4.7%)	5
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	4 (3.1%)	0
		Icy Cr 09.0125	Icy Cr H	2 (1.6%)	0
	S Puget Sound (5.5%)	Minter Cr 15.0048	Minter Cr H	7 (5.5%)	0
Col River (1.6%)	Upper Col R (0.8%)	Entiat R 46.0042	Entiat NFH	1 (0.8%)	0
	Central Col R (0.8%)	Umatilla R	Bonnaville H	1 (0.8%)	1
<b>Total</b>				<b>128</b>	<b>38</b>

**Table 2.5** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates from the 2013-14 winter Chinook MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hrs Fished	AD	UM	AD	UM	
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0
52	1	7.3	4	0	1	0	5
53/1	1	2.0	0	0	0	0	0
2	4	25.0	3	3	2	2	10
3	5	31.8	8	5	5	0	18
4	4	30.0	9	3	2	2	16
5	4	28.3	5	3	1	2	11
6	0	0.0	0	0	0	0	0
7	1	6.3	0	0	0	0	0
8	2	15.0	7	0	0	0	7
9	5	31.8	4	2	1	1	8
10	4	27.4	4	3	3	2	12
11	5	33.6	8	2	0	0	10
12	4	27.8	2	1	3	0	6
13	4	26.3	1	1	0	0	2
14	5	34.8	10	2	1	0	13
15	5	34.9	6	5	0	1	12
16	4	27.5	6	2	2	1	11
17	5	29.4	12	4	3	1	20
18	2	13.0	5	3	1	0	9
<b>Total</b>	<b>65</b>	<b>431.9</b>	<b>94</b>	<b>39</b>	<b>25</b>	<b>12</b>	<b>170</b>
<b>Size/mark-status composition:</b>			0.55 (0.0015)	0.23 (0.0010)	0.15 (0.0007)	0.07 (0.0004)	
<b>Legal size mark rate:</b>			0.71 (0.0016)				
<b>Overall mark rate:</b>			0.70 (0.0012)				



**Figure 2.5** Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook encountered by test fishers during the 2013-14 winter Chinook MSF in Marine Area 7. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).

**Table 2.6** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2013-14 winter Chinook MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	40 1-trip VTRs, 66 Angler Trips	72	14	19	0	105	0.87	0.84
Size/mark-status composition:		0.69	0.13	0.18	0.00			
Variance:		(0.002)	(0.001)	(0.001)	(0.000)			

We used Pearson’s chi-square test to compare the Chinook size and mark-status composition of the Area 7 test fishery and VTR data. Results suggest a significant difference in composition between the two data sets ( $\chi^2 = 12.88$ ,  $df = 3$ ,  $p < 0.01$ ), indicating that they could not be combined. Thus, given the sufficient sample sizes in the test fishery data (and assuming higher data quality), we elected to use only this data as an estimate of the Chinook size/mark-status proportions needed for estimating total Chinook encounters and associated mortalities in the Area 7 mark-selective fishery.

**Table 2.7** Summary of season-wide fishery impact estimates for the 2013-14 winter Chinook MSF in Marine Area 7. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

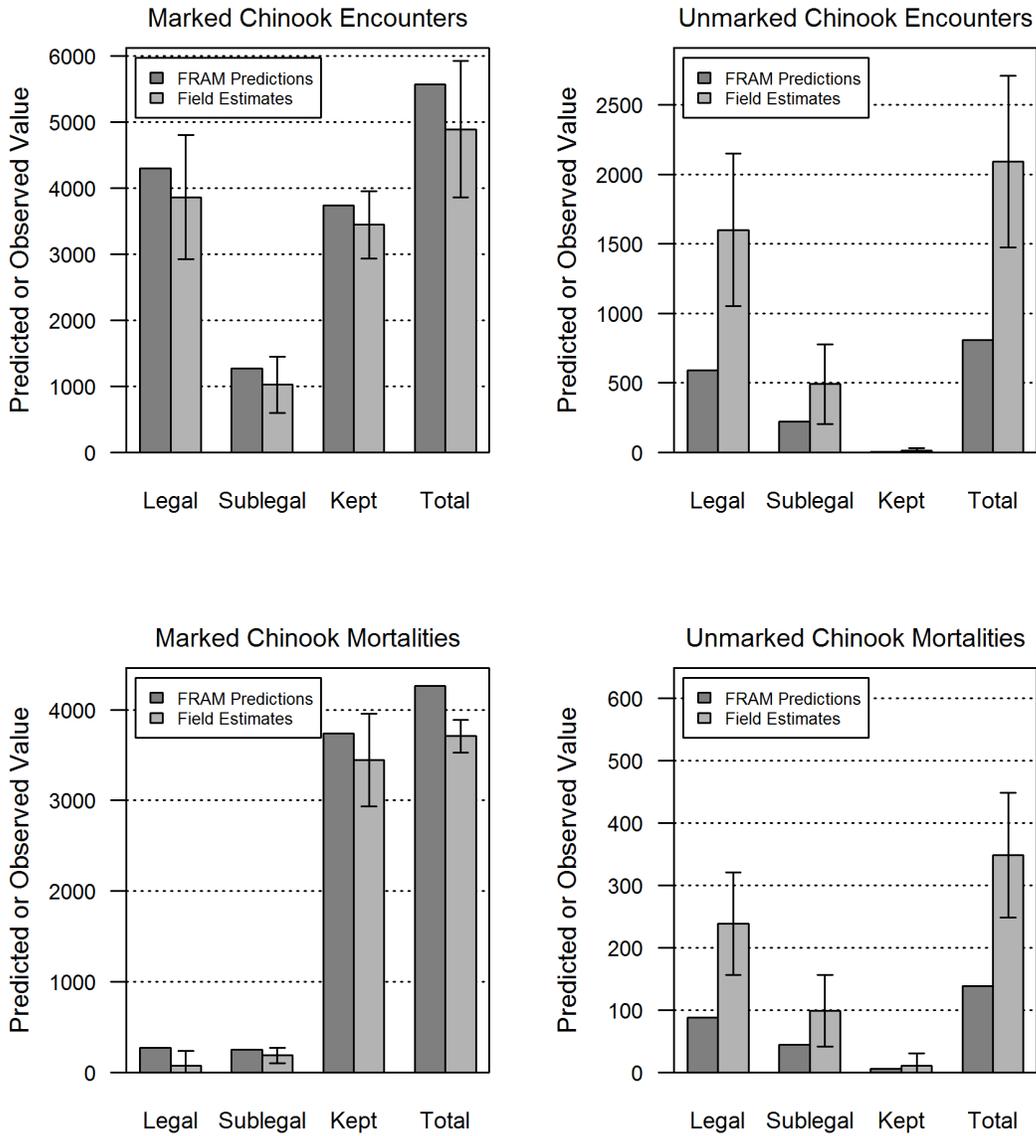
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	3,861	3,359	502	75	3,434	74,052	272	2,901 - 3,967	8
Legal UM	1,602	11	1,591	239	250	1,857	43	165 - 334	17
Sublegal AD	1,027	86	941	188	274	2,117	46	184 - 364	17
Sublegal UM	493	0	493	99	99	853	29	41 - 156	30
<b>Total</b>	<b>6,982</b>	<b>3,456</b>	<b>3,526</b>	<b>601</b>	<b>4,056</b>	<b>78,879</b>	<b>281</b>	<b>3,506 - 4,607</b>	<b>7</b>

**Table 2.8** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters for the 2013-14 winter Chinook MSF in Marine Area 7. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	811	591	220	6
	AD	5,567	4,297	1,270	3,738
	Total	6,378	4,888	1,490	3,744
	% Marked	87	88	85	100
Estimated (Creel) Encounters	UM	2,095	1,602	493	11
	AD	4,887	3,861	1,027	3,445
	Total	6,982	5,462	1,520	3,456
	% Marked	70	71	68	100

**Table 2.9** Comparison of modeled (FRAM model run 1213) and estimated total Chinook mortalities for the 2013-14 winter Chinook MSF in Marine Area 7. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	138	4,263	4,401	348	3,708	4,056
Released Legal	88	271	359	239	75	314
Released Sublegal	44	254	298	99	188	287
Landed Only	6	3,738	3,744	11	3,445	3,456



**Figure 2.6** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters and mortalities for the 2013-14 winter Chinook MSF in Marine Area 7. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 2.10** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2013-14 winter Chinook MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Bernie Gobin Hatchery	2010	3	8.9	17.39	8.9	0.9	0.173	0.72
Bonneville Hatchery	2010	1	3.0	5.80	3.2	0.3	0.070	0.26
George Adams Hatchery	2010	3	8.9	17.39	9.0	0.9	0.180	0.74
Grovers Creek Hatchery	2009	1	3.0	5.80	2.9	0.3	0.054	0.23
Grovers Creek Hatchery	2010	4	11.8	23.18	11.8	1.2	0.231	0.96
Chilliwack River Hatchery	2010	3	8.9	17.39	4.3	0.4	0.042	0.35
Chilliwack River Hatchery	2011	2	5.9	11.59	3.0	0.3	0.030	0.24
Kendall Creek Hatchery	2010	1	3.0	5.80	2.9	0.3	0.054	0.23
Marblemount Hatchery	2009	2	5.9	11.59	5.9	0.6	0.116	0.48
Marblemount Hatchery	2010	9	26.6	52.16	28.8	2.9	0.608	2.34
Samish Hatchery	2010	4	11.8	23.18	12.3	1.2	0.250	1.00
Soos Creek Hatchery	2010	3	8.9	17.39	9.1	0.9	0.183	0.74
Wallace River Hatchery	2009	1	3.0	5.80	2.9	0.3	0.058	0.24
Wallace River Hatchery	2010	1	3.0	5.80	3.0	0.3	0.059	0.24
<b>Total</b>		<b>38</b>	<b>112.4</b>	<b>220.23</b>	<b>108.0</b>	<b>10.8</b>	<b>2.107</b>	<b>8.79</b>

**Table 2.11** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) for the 2013-14 winter Chinook MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
December	48 - 52	1 Dec - 29 Dec	910	0	910	356	3	359	39.5
January	53/1 - 5	30 Dec - 2 Feb	1,160	11	1,171	251	1	252	21.5
February	6 - 9	3 Feb - 2 Mar	469	0	469	250	2	252	53.7
March	10 - 13	3 Mar - 30 Mar	623	0	623	248	0	248	39.8
April	14 - 18	31 Mar - 30 Apr	283	0	283	57	0	57	20.1
<b>Season Total</b>			<b>3,445</b>	<b>11</b>	<b>3,456</b>	<b>1,162</b>	<b>6</b>	<b>1,168</b>	<b>33.8</b>

<sup>1</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWTs, from all sites sampled during the winter 2013-14 Area 7 Chinook MSF (the three sample-frame sites included in the creel estimates, derby samples, and the fish sampled as part of baseline sampling in Area 7).

**Table 2.12** Fishery-total estimates of retained and released salmon (*other than Chinook*) during the 2013-14 winter Chinook MSF in Marine Area 7. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status.

Week	Start Date	End Date	Released Salmon
			Unknown Salmonid
48	1-Dec	1-Dec	0
49	2-Dec	8-Dec	0
50	9-Dec	15-Dec	0
51	16-Dec	22-Dec	0
52	23-Dec	29-Dec	4
53/1	30-Dec	5-Jan	0
2	6-Jan	12-Jan	0
3	13-Jan	19-Jan	0
4	20-Jan	26-Jan	0
5	27-Jan	2-Feb	0
6	3-Feb	9-Feb	0
7	10-Feb	16-Feb	0
8	17-Feb	23-Feb	0
9	24-Feb	2-Mar	0
10	3-Mar	9-Mar	0
11	10-Mar	16-Mar	0
12	17-Mar	23-Mar	0
13	24-Mar	30-Mar	0
14	31-Mar	6-Apr	0
15	7-Apr	13-Apr	0
16	14-Apr	20-Apr	0
17	21-Apr	27-Apr	0
18	28-Apr	30-Apr	0
<b>Season Total:</b>			<b>4</b>
<b>Variance:</b>			8
<b>Standard Error:</b>			3
<b>CV (%):</b>			68
<b>95% CI:</b>			0 - 10

**Table 2.13** Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the three-site sample frame during the 2013-14 winter Chinook MSF in Marine Area 7. See Methods Report (WDFW 2012a) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, $f_{ij}$
		Start Time	End Time	Total Boats, $m_{ij}$	Sampled Boats	Active Boats, $X_{ij}$	Total Boats, $S_{y_{ijk}}$	
4-Dec	WD	11:11	12:12	24	8	5	38	0.208
28-Dec	WE	10:35	11:43	124	70	62	140	0.500
4-Jan	WE	12:02	13:12	140	76	58	183	0.414
24-Jan	WE	12:04	13:04	47	28	23	57	0.489
31-Jan	WE	12:10	13:12	28	14	9	44	0.321
1-Feb	WE	11:12	12:14	112	68	55	138	0.491
21-Feb	WE	10:55	12:01	52	25	21	62	0.404
28-Feb	WE	11:34	12:38	18	8	5	29	0.278
7-Mar	WE	11:27	12:24	26	17	10	44	0.385
15-Mar	WE	11:17	12:35	43	16	14	49	0.326
22-Mar	WE	10:55	12:05	66	62	46	89	0.697
31-Mar	WD	11:33	12:34	36	12	7	62	0.194
18-Apr	WE	10:17	11:21	35	2	1	70	0.029
20-Apr	WE	9:30	10:48	14	6	4	21	0.286
<b>Totals:</b>				<b>765</b>	<b>412</b>	<b>320</b>	<b>1027</b>	
Mean:				55	29	23	73	0.359
St Dev:				41.1	27.0	22.4	47.9	0.164
CV(%):				75%	92%	98%	65%	46%

**Table 2.14** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 7 Winter Chinook MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Area	Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
7	Feb 1 - Feb 29, 2008	4,862	1,301	2	24	0	200	1,042	244	155	2,967
7	Feb 1 - Apr 15, 2009	8,167	1,406	9	14	0	210	708	139	17	2,501
7	Dec 1, 2009 - Apr 30, 2010	9,589	1,400	0	18	0	209	673	150	74	2,524
7	Dec 1, 2010 - Apr 30, 2011	11,814	2,368	4	10	0	354	1,988	521	531	5,776
7	Dec 1, 2011 - Apr 30, 2012	10,536	2,359	0	54	0	353	1,446	1,935	678	6,825
7	Dec 1, 2012 - Apr 30, 2013	10,322	3,469	3	106	0	518	1,363	817	332	6,609
7	Dec 1, 2013 - Apr 30, 2014	12,382	3,359	11	86	0	502	1,591	941	493	6,982

### **3) Marine Areas 8-1 & 8-2 Winter Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented a ninth consecutive winter Chinook MSF in Marine Areas 8-1 and 8-2 from November 1, 2013 through April 30, 2014. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Areas 8-1 and 8-2 during the November-April season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, and collection of VTRs from the angling public. **Table 3.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In the following section we present results from our monitoring activities during the Areas 8-1 and 8-2 winter Chinook MSF from November 1, 2013 through April 30, 2014.

**Table 3.1** Sampling/estimation details on target parameters associated with the overall Areas 8-1 and 8-2 Chinook MSF monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum we sampled $n=2$ days out of $N=3$ available weekend days per week.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., “size measures” or “weights” of sampled sites) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats and anglers.	Month	A total of 5 boat surveys were conducted during the six-month fishery. The results of these surveys were incorporated into multi-year site-weight averages.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., Coho) that the angler may record on the VTR form	Fish encounter	Season (6 months)	We combined the Areas 8-1 and 8-2 VTR data to estimate the size/mark-status proportions (LM = 44%, LU = 13%, SM = 29%, SU = 14%; <b>Table 3.6</b> ) needed to produce encounter and mortality estimates.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season (6 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire Tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (6 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

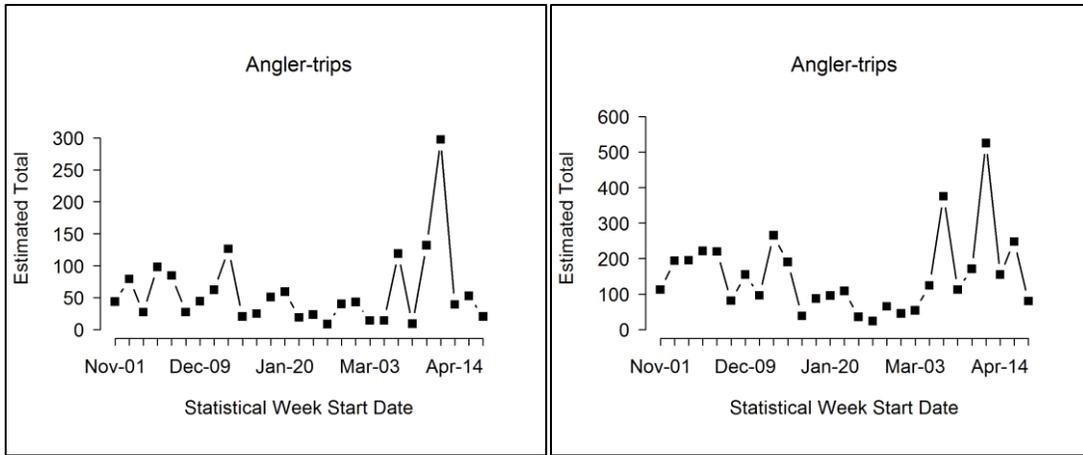
<sup>1</sup>The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

**Table 3.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2013-14 winter Chinook MSF in Marine Area 8-1. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

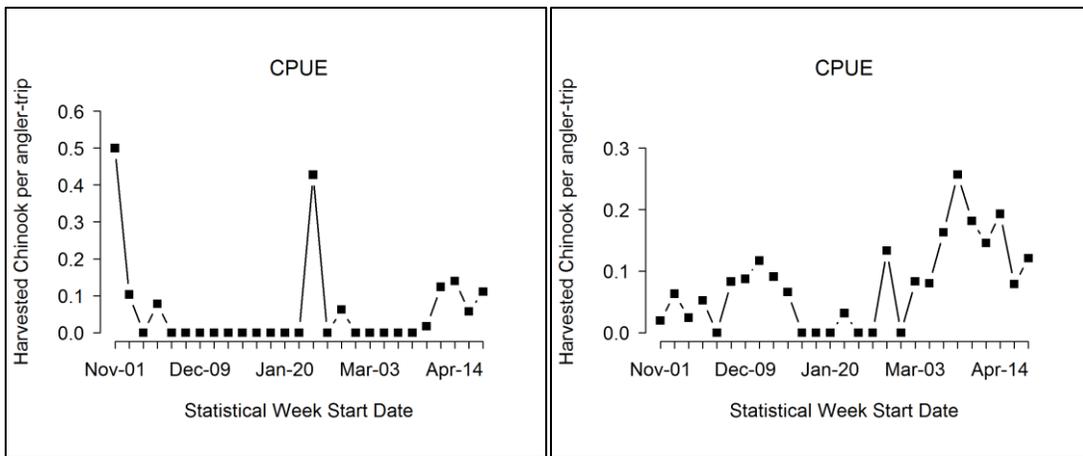
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Nov	44	1-Nov	3-Nov	22	44	22	0	19	15	56
	45	4-Nov	10-Nov	41	79	8	0	7	6	21
	46	11-Nov	17-Nov	14	27	0	0	0	0	0
	47	18-Nov	24-Nov	56	98	8	0	6	5	19
	48	25-Nov	1-Dec	48	84	0	0	0	0	0
Dec	49	2-Dec	8-Dec	15	27	0	0	0	0	0
	50	9-Dec	15-Dec	26	44	0	0	0	0	0
	51	16-Dec	22-Dec	30	62	0	0	0	0	0
	52	23-Dec	29-Dec	62	126	0	0	0	0	0
Jan	53/1	30-Dec	5-Jan	11	20	0	0	0	0	0
	2	6-Jan	12-Jan	17	25	0	0	0	0	0
	3	13-Jan	19-Jan	23	51	0	0	0	0	0
	4	20-Jan	26-Jan	28	59	0	0	0	0	0
	5	27-Jan	2-Feb	9	19	0	0	0	0	0
Feb	6	3-Feb	9-Feb	13	24	10	0	9	7	26
	7	10-Feb	16-Feb	6	9	0	0	0	0	0
	8	17-Feb	23-Feb	17	40	3	0	2	2	6
	9	24-Feb	2-Mar	23	43	0	0	0	0	0
Mar	10	3-Mar	9-Mar	7	14	0	0	0	0	0
	11	10-Mar	16-Mar	10	14	0	0	0	0	0
	12	17-Mar	23-Mar	55	119	0	0	0	0	0
	13	24-Mar	30-Mar	5	9	0	0	0	0	0
Apr	14	31-Mar	6-Apr	58	132	2	0	2	2	6
	15	7-Apr	13-Apr	135	297	37	0	31	26	94
	16	14-Apr	20-Apr	24	39	5	0	5	4	14
	17	21-Apr	27-Apr	27	53	3	0	3	2	8
	18	28-Apr	30-Apr	11	20	2	0	2	2	6
<b>Season Total:</b>				<b>791</b>	<b>1,579</b>	<b>100</b>	<b>0</b>	<b>85</b>	<b>70</b>	<b>255</b>
<b>Variance:</b>				5,782	26,311	496	0	1,702	236	3,808
<b>SE:</b>				76	162	22	--	41	15	62
<b>CV (%):</b>				10	10	22	--	49	22	24
<b>95% CI:</b>				642 - 940	1,262 - 1,897	56 - 144	--	4 - 166	40 - 100	134 - 376

**Table 3.3** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2013-14 winter Chinook MSF in Marine Area 8-2. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

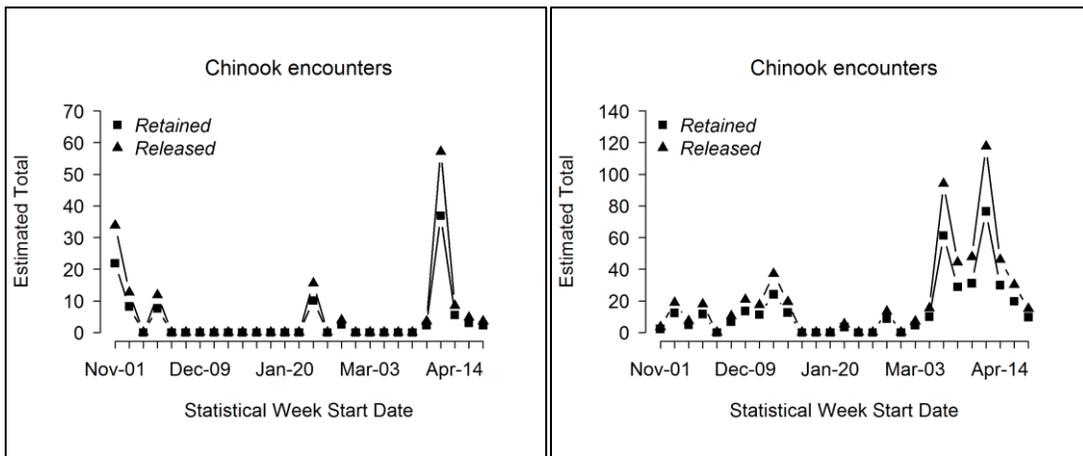
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Nov	44	1-Nov	3-Nov	60	112	2	0	2	2	6
	45	4-Nov	10-Nov	103	194	12	0	10	9	31
	46	11-Nov	17-Nov	98	195	5	0	4	3	12
	47	18-Nov	24-Nov	123	221	12	0	10	8	29
	48	25-Nov	1-Dec	106	220	0	0	0	0	0
Dec	49	2-Dec	8-Dec	53	81	7	0	6	5	17
	50	9-Dec	15-Dec	94	155	14	0	11	9	34
	51	16-Dec	22-Dec	52	96	11	0	9	8	29
	52	23-Dec	29-Dec	133	265	24	0	20	17	61
Jan	53/1	30-Dec	5-Jan	95	190	13	0	11	9	32
	2	6-Jan	12-Jan	23	39	0	0	0	0	0
	3	13-Jan	19-Jan	51	87	0	0	0	0	0
	4	20-Jan	26-Jan	63	96	0	0	0	0	0
	5	27-Jan	2-Feb	60	109	3	0	3	2	9
Feb	6	3-Feb	9-Feb	24	36	0	0	0	0	0
	7	10-Feb	16-Feb	18	24	0	0	0	0	0
	8	17-Feb	23-Feb	42	65	9	0	7	6	22
	9	24-Feb	2-Mar	34	45	0	0	0	0	0
Mar	10	3-Mar	9-Mar	34	54	4	0	4	3	11
	11	10-Mar	16-Mar	64	124	10	0	8	7	25
	12	17-Mar	23-Mar	145	376	61	0	51	43	155
	13	24-Mar	30-Mar	59	112	29	0	24	20	73
Apr	14	31-Mar	6-Apr	77	171	31	0	26	22	79
	15	7-Apr	13-Apr	264	525	76	0	64	53	194
	16	14-Apr	20-Apr	82	155	30	0	25	21	76
	17	21-Apr	27-Apr	124	248	20	0	16	14	50
	18	28-Apr	30-Apr	41	80	10	0	8	7	25
<b>Season Total:</b>				<b>2,122</b>	<b>4,076</b>	<b>382</b>	<b>0</b>	<b>321</b>	<b>267</b>	<b>970</b>
<b>Variance:</b>				22,840	93,081	2,489	0	11,533	2,273	23,866
<b>SE:</b>				151	305	50	--	107	48	154
<b>CV (%):</b>				7	7	13	--	33	18	16
<b>95% CI:</b>				1,826 - 2,418	3,478 - 4,674	285 - 480	--	111 - 532	173 - 360	667 - 1,273



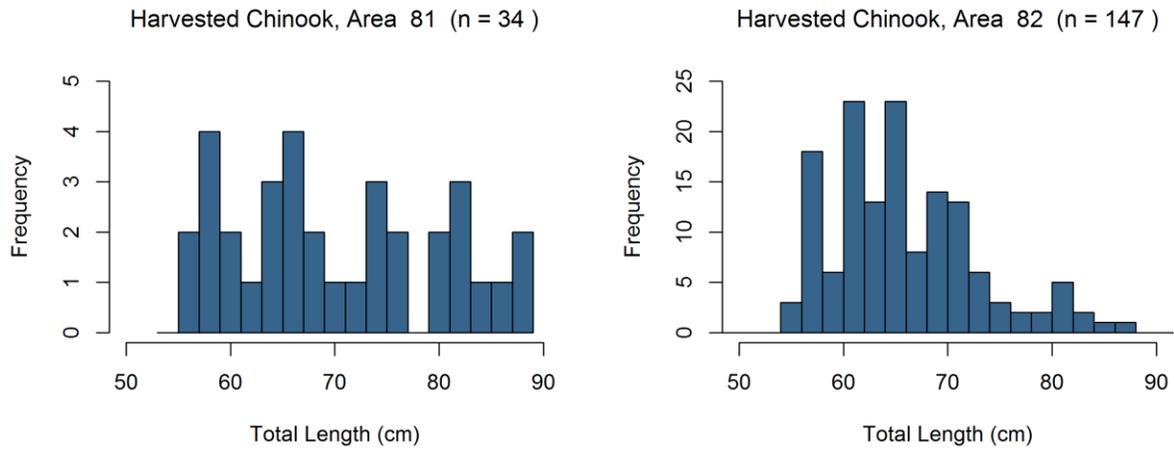
**Figure 3.1** Temporal patterns in fishing effort during the 2013-14 winter Chinook MSFs in Marine Areas 8-1 (*left panel*) and 8-2 (*right panel*).



**Figure 3.2** Temporal patterns in CPUE (number of Chinook landed per angler trip) during the 2013-14 winter Chinook MSFs in Marine Areas 8-1 (*left panel*) and 8-2 (*right panel*).



**Figure 3.3** Temporal patterns in Chinook encounters (number retained and released) during the 2013-14 winter Chinook MSFs in Marine Areas 8-1 (*left panel*) and 8-2 (*right panel*).



**Figure 3.4** Length-frequency distributions of retained marked Chinook sampled in dockside angler interviews during the 2013-14 winter Chinook MSFs in Marine Areas 8-1 (*left panel*) and 8-2 (*right panel*).

**Table 3.4** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2013-14 winter Chinook MSFs in Marine Areas 8-1 (*upper panel*) and 8-2 (*lower panel*).

**Area 8-1**

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	33	1	34
Unmarked	0	0	0
<b>Total</b>	<b>33</b>	<b>1</b>	<b>34</b>

**Area 8-2**

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	142	5	147
Unmarked	0	0	0
<b>Total</b>	<b>142</b>	<b>5</b>	<b>147</b>

**Table 3.5** Summary of CWTs recovered from Chinook salmon harvested during the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
B.C. (5.3%)	Fraser-Thompson River (5.3%)	Chilliwack R	Chilliwack River H	1 (5.3%)	1
WA (94.7%)	N Washington (21.1%)	Boyd Cr 01.0490	Kendall Cr H	1 (5.3%)	0
		Friday Cr 03.0017	Samish H	3 (15.8%)	0
	Hood Canal (5.3%)	Finch Cr 16.0222	Hoodsport H	1 (5.3%)	0
	N Puget Sound (21.1%)	Tulalip Cr 07.0001	Bernie Gobin H	1 (5.3%)	0
		Wallace R 07.0940	Wallace R H	2 (10.5%)	0
		Whitehorse Springs	Stillaguamish H	1 (5.3%)	0
	Mid Puget Sound (15.8%)	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	1 (5.3%)	0
		Grovers Cr Hatchery	Grovers Cr H	2 (10.5%)	0
	S Puget Sound (31.6%)	Clear Cr 11.0013C	Clear Creek H	2 (10.5%)	0
Minter Cr 15.0048		Minter Cr H	4 (21.1%)	0	
<b>Total</b>				<b>19</b>	<b>1</b>

**Table 3.6** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs during the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR Area 8-1	6 1-trip VTRs, 11 Angler Trips	3	0	2	3	8	0.63	1.00
Private VTR Area 8-2	95 1-trip VTRs, 180 Angler Trips	67	21	44	20	152	0.73	0.76
<b>VTR Total</b>	<b>101 1-trip VTRs, 191 Angler Trips</b>	<b>70</b>	<b>21</b>	<b>46</b>	<b>23</b>	<b>160</b>	<b>0.73</b>	<b>0.77</b>
Combined size/mark-status composition:		<b>0.44</b>	<b>0.13</b>	<b>0.29</b>	<b>0.14</b>			
Variance:		<b>(0.0015)</b>	<b>(0.0007)</b>	<b>(0.0013)</b>	<b>(0.0008)</b>			

Due to small sample sizes from Area 8-1, we used Fisher’s Exact test to compare the Chinook size and mark-status composition of the Areas 8-1 and 8-2 VTR data. Results suggested no significant difference in composition between the two data sets ( $p = 0.29$ ). Thus, due to the small sample sizes in Area 8-1, we elected to combine the two VTR data sets to provide a single estimate of Chinook size/mark-status proportions. This combined set of proportions was used to estimate total Chinook encounters and associated mortalities for the mark-selective fisheries in Areas 8-1 and 8-2 combined.

**Table 3.7** Summary of season-wide fishery impact estimates for the 2013-14 winter Chinook MSFs in Marine Areas 8-1 (*upper panel*) and 8-2 (*lower panel*). Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

**Area 8-1**

Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	112	97	15	2	99	505	22	55 - 143	23
Legal UM	34	0	34	5	5	2	2	2 - 8	31
Sublegal AD	73	3	70	14	17	25	5	7 - 27	29
Sublegal UM	37	0	37	7	7	5	2	3 - 12	31
<b>Total</b>	<b>255</b>	<b>100</b>	<b>155</b>	<b>29</b>	<b>129</b>	<b>537</b>	<b>23</b>	<b>83 - 174</b>	<b>18</b>

**Area 8-2**

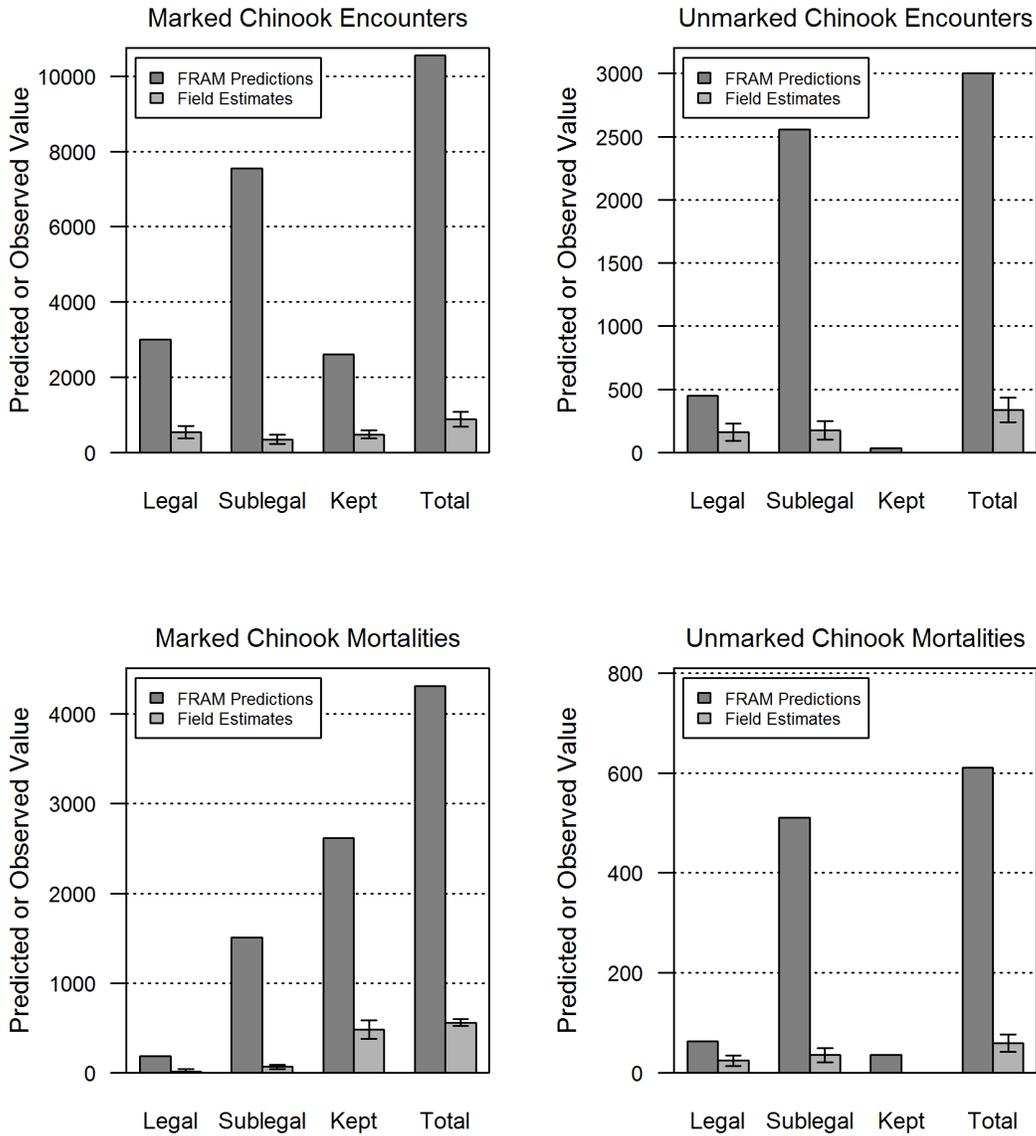
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	424	369	55	8	378	2,542	50	279 - 476	13
Legal UM	127	0	127	19	19	24	5	9 - 29	26
Sublegal AD	279	13	266	53	66	163	13	41 - 91	19
Sublegal UM	139	0	139	28	28	48	7	14 - 41	25
<b>Total</b>	<b>970</b>	<b>382</b>	<b>588</b>	<b>108</b>	<b>491</b>	<b>2,777</b>	<b>53</b>	<b>387 - 594</b>	<b>11</b>

**Table 3.8** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters for the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2, combined. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	3,004	449	2,555	36
	AD	10,557	3,007	7,550	2,616
	Total	13,561	3,456	10,105	2,652
	% Marked	78	87	75	99
Estimated (Creel) Encounters	UM	337	161	176	0
	AD	889	536	352	482
	Total	1,226	697	529	482
	% Marked	73	77	67	100

**Table 3.9** Comparison of modeled (FRAM model run 1213) and estimated total Chinook mortalities for the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2, combined. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	610	4,315	4,925	59	560	620
Released Legal	63	189	252	24	10	35
Released Sublegal	511	1,510	2,021	35	67	103
Landed Only	36	2,616	2,652	0	482	482



**Figure 3.5** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters and mortalities for the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2, combined. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 3.10** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2, combined. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Chilliwack River Hatchery	2011	1	2.6	4.16	1.3	0.1	0.011	0.1
<b>Total</b>		<b>1</b>	<b>2.6</b>	<b>4.16</b>	<b>1.3</b>	<b>0.1</b>	<b>0.011</b>	<b>0.1</b>

**Table 3.11** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) for the 2013-14 winter Chinook MSFs in Marine Areas 8-1 (*upper panel*) and 8-2 (*lower panel*).

**Area 8-1**

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
November	44 - 48	1 Nov - 1 Dec	38	0	38	10	0	10	26.6%
December	49 - 52	2 Dec - 29 Dec	0	0	0	1	0	1	--
January	53.1 - 5	30 Dec - 2 Feb	0	0	0	1	0	1	--
February	6 - 9	3 Feb - 2 Mar	13	0	13	5	0	5	39.8%
March	10 - 13	3 Mar - 30 Mar	0	0	0	0	0	0	--
April	14 - 18	31 Mar - 30 Apr	50	0	50	17	0	17	34.1%
<b>Season Total</b>			<b>100</b>	<b>0</b>	<b>100</b>	<b>34</b>	<b>0</b>	<b>34</b>	<b>34%</b>

**Area 8-2**

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
November	44 - 48	1 Nov - 1 Dec	31	0	31	15	0	15	48.7%
December	49 - 52	2 Dec - 29 Dec	56	0	56	22	0	22	39.5%
January	53.1 - 5	30 Dec - 2 Feb	16	0	16	7	0	7	43.8%
February	6 - 9	3 Feb - 2 Mar	9	0	9	12	0	12	--
March	10 - 13	3 Mar - 30 Mar	104	0	104	35	0	35	33.5%
April	14 - 18	31 Mar - 30 Apr	167	0	167	56	0	56	33.6%
<b>Season Total</b>			<b>382</b>	<b>0</b>	<b>382</b>	<b>147</b>	<b>0</b>	<b>147</b>	<b>38.4%</b>

<sup>1</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWTs, from all sites sampled during the winter 2013-14 Area 8-1 and 8-2 Chinook MSFs (the sample-frame sites included in the creel estimates and the fish sampled as part of baseline sampling in the Area).

**Table 3.12** Fishery-total estimates of retained and released salmon (*other than Chinook*) during the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2. AD = marked (adipose-clipped), UM = Unmarked, UK = unknown mark-status. Values may not add exactly due to rounding error.

Week	Start Date	End Date	AREA 8-1			AREA 8-2			
			Released			Retained	Released		
			Coho UK	Cutthroat	Dolly Varden	Chum	Coho UM	Chum	Unk Salmon
44	1-Nov	3-Nov	0	0	0	0	0	0	2
45	4-Nov	10-Nov	0	0	0	2	0	5	3
46	11-Nov	17-Nov	0	0	0	0	0	3	7
47	18-Nov	24-Nov	4	0	0	3	3	0	0
48	25-Nov	1-Dec	0	0	0	3	3	0	0
49	2-Dec	8-Dec	0	0	0	0	0	0	0
50	9-Dec	15-Dec	0	0	0	0	0	0	0
51	16-Dec	22-Dec	0	0	0	0	0	0	0
52	23-Dec	29-Dec	0	0	0	0	0	0	7
53.1	30-Dec	5-Jan	0	0	0	0	0	0	0
2	6-Jan	12-Jan	0	0	0	0	0	0	0
3	13-Jan	19-Jan	0	0	0	0	0	0	12
4	20-Jan	26-Jan	0	0	0	0	0	0	12
5	27-Jan	2-Feb	0	0	0	0	0	0	0
6	3-Feb	9-Feb	0	0	0	0	0	0	0
7	10-Feb	16-Feb	0	0	0	0	0	0	0
8	17-Feb	23-Feb	0	0	0	0	0	0	0
9	24-Feb	2-Mar	0	0	0	0	0	0	2
10	3-Mar	9-Mar	0	0	0	0	0	0	0
11	10-Mar	16-Mar	0	0	0	0	0	0	0
12	17-Mar	23-Mar	0	0	0	0	0	0	4
13	24-Mar	30-Mar	0	0	0	0	0	0	6
14	31-Mar	6-Apr	0	0	0	0	0	0	6
15	7-Apr	13-Apr	0	7	7	0	0	0	2
16	14-Apr	20-Apr	0	0	0	0	0	0	0
17	21-Apr	27-Apr	0	0	0	0	0	0	0
18	28-Apr	30-Apr	0	0	0	0	0	0	0
<b>Season Total:</b>			<b>4</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>7</b>	<b>8</b>	<b>63</b>
Variance:			11	33	33	28	36	28	577
Standard Error:			3	6	6	5	6	5	24
CV (%):			83	81	81	66	89	66	38
95% CI:			0 - 11	0 - 18	0 - 18	0 - 18	0 - 18	0 - 18	15 - 110

**Table 3.13** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2. Bold sites indicate those included in the dockside sample frame.

Area	Site Name	Total Anglers	Season Total (unadjusted) Size Measure
<b>8-1</b>	<b>Camano Island State Park Ramp</b>	<b>5</b>	<b>0.208</b>
8-1	Edmonds Sling	3	0.125
<b>8-1</b>	<b>Maple Grove Ramp</b>	<b>13</b>	<b>0.542</b>
<b>8-1</b>	<b>Oak Harbor Marina/Ramp</b>	<b>3</b>	<b>0.125</b>
<b>Area 8-1 Total Anglers</b>		<b>24</b>	<b>1.00</b>
<b>8-2</b>	<b>Bayside Marina/Drystack</b>	<b>2</b>	<b>0.030</b>
<b>8-2</b>	<b>Camano Isl. State Park</b>	<b>3</b>	<b>0.045</b>
<b>8-2</b>	<b>Dagmar's Landing</b>	<b>2</b>	<b>0.030</b>
8-2	Edmonds Boat Basin	4	0.060
8-2	Edmonds Marina	2	0.030
8-2	Everett Marina	15	0.224
<b>8-2</b>	<b>Everett Ramp</b>	<b>36</b>	<b>0.537</b>
8-2	Marysville Public Ramp	2	0.030
8-2	Sandy Point Marina/Ramp	1	0.015
<b>Area 8-2 Total Anglers</b>		<b>67</b>	<b>1.00</b>

**Table 3.14** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 8-1 and 8-2 Winter Chinook MSFs. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Area	Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
8-1	Oct 1, 2005 - Apr 30, 2006	3,976	303	0	39	0	45	188	763	575	1,914
8-1	Oct 1, 2006 - Apr 30, 2007	3,454	278	8	37	4	42	118	1,437	857	2,781
8-1	Nov 1, 2007 - Apr 30, 2008	3,288	638	5	36	0	95	304	1,345	577	3,000
8-1	Jan 1, 2009 - Apr 30, 2009	2,518	396	12	7	0	59	45	1,443	909	2,870
8-1	Nov 1, 2009 - Apr 30, 2010	3,192	273	0	11	0	41	45	595	269	1,234
8-1	Nov 1, 2010 - Apr 30, 2011	2,398	87	0	9	0	13	15	91	69	283
8-1	Nov 1, 2011 - Apr 30, 2012	2,767	284	0	7	0	42	136	1,027	272	1,768
8-1	Nov 1, 2012 - Apr 30, 2013	2,046	268	0	14	0	40	88	955	793	2,158
8-1	Nov 1, 2013 - Apr 30, 2014	1,579	97	0	3	0	15	34	70	37	255
8-2	Oct 1, 2005 - Apr 30, 2006	8,521	735	40	35	0	106	618	1,706	876	4,116
8-2	Oct 1, 2006 - Apr 30, 2007	7,848	766	18	95	3	113	183	10,486	5,407	17,071
8-2	Nov 1, 2007 - Apr 30, 2008	5,678	795	15	74	3	114	181	942	303	2,428
8-2	Jan 1, 2009 - Apr 30, 2009	5,946	495	15	14	0	74	18	1,557	468	2,641
8-2	Nov 1, 2009 - Apr 30, 2010	6,732	814	4	10	0	122	164	1,300	487	2,902
8-2	Nov 1, 2010 - Apr 30, 2011	3,505	111	0	5	0	17	20	122	88	363
8-2	Nov 1, 2011 - Apr 30, 2012	5,197	470	2	27	0	70	223	1,683	450	2,925
8-2	Nov 1, 2012 - Apr 30, 2013	4,260	346	0	17	0	52	113	1,231	1,021	2,780
8-2	Nov 1, 2013 - Apr 30, 2014	4,076	369	0	13	0	55	127	266	139	970

#### 4) Marine Area 9 Winter Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a seventh consecutive winter Chinook MSF in Marine Area 9 from November 1-30, 2013 and January 16– April 15, 2014. WDFW’s Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 9 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, aerial effort surveys, test fishing and collection of VTRs from the angling public. **Table 4.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In the following section we present results from our monitoring activities during the Area 9 winter Chinook MSF from November 1-30, 2013 and January 16-April 30, 2014. In addition to the major components of the results described previously (page 3), we present the aerial survey and dockside data used to estimate the sample fraction in Area 9 (see WDFW 2012a, *Aerial-Access Design*). The four sites included in the Area 9 dockside sample frame are Port Townsend Ramp, Kingston Ramp, Everett Ramp and Edmonds Ramp, which are assumed to be the highest-use access sites for Area 9 anglers. The Olympic Peninsula Derby took place from February 15-17 over portions of Marine Areas 6 and 9. Total derby effort was allocated to each Marine Area using the proportion of effort that occurred in each area based on dockside sampling efforts at designated weigh-in stations during the derby. Total catch by Marine Area was reported by the derby. Beginning on February 10, 2014, the daily limit of marked Chinook was reduced to one fish (from two) per angler due to higher than projected legal encounters.

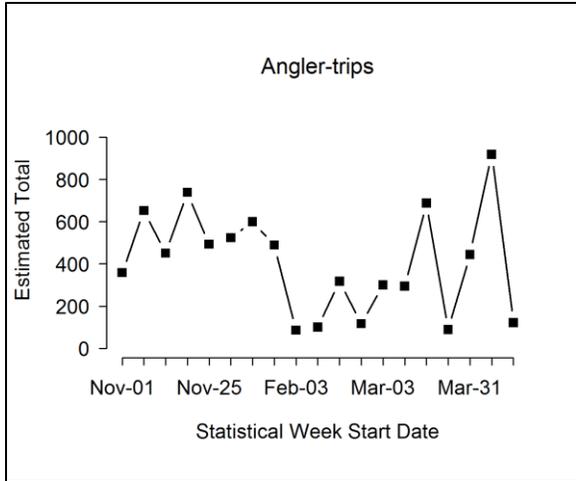
**Table 4.1** Sampling/estimation details on target parameters associated with the overall Area 9 winter Chinook MSF monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum we sampled $n=2$ days out of $N=3$ available weekend days per week.
Aerial Surveys	Fraction of Area 9 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, $f_{ij}$ ).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Month	The sample fraction was calculated for individual aerial survey dates (see <b>Table 4.12</b> ; $n=17$ surveys conducted out of $N=120$ days available in the season). Since mean sample fractions were similar between the Nov and Jan-Apr time strata, one season total sample fraction was calculated and used to calculate estimates of Chinook encounters and mortality.
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season	Since there was no significant difference, we combined the Nov and Jan-Apr test fishery data to estimate the size/mark-status proportions (LM = 37%, LU = 12%, SM = 41% and SU = 10%; see <b>Table 4.5</b> ) needed to produce encounter and mortality estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., Coho) that the angler may record on the VTR form	Fish encounter	Season	VTR data ( <b>Table 4.6</b> ) were not used for impact estimation steps due to the assumed higher data quality and sufficient sample size of the test fishery data. See comment in row above.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

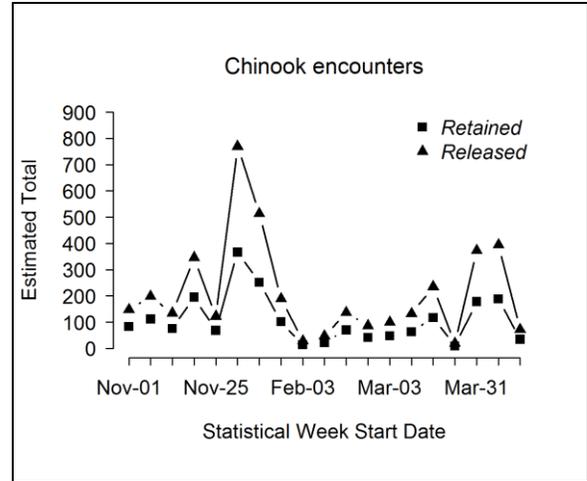
<sup>1</sup> The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.<sup>2</sup> Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

**Table 4.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2013-14 winter Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

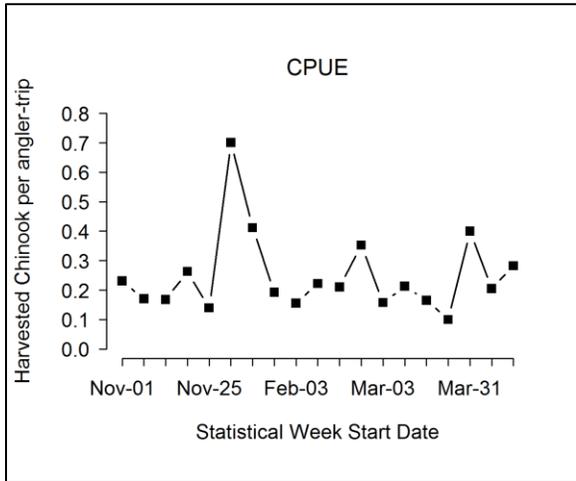
Month	Stat Week	Start Date	End Date	Estimated Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Nov	44	1-Nov	3-Nov	207	359	83	0	113	57	253
	45	4-Nov	10-Nov	355	652	111	0	153	76	340
	46	11-Nov	17-Nov	251	451	76	0	104	52	231
	47	18-Nov	24-Nov	390	738	195	0	267	134	595
	48	25-Nov	30-Nov	253	493	69	0	94	47	210
<b>November Total:</b>				1,456	2,693	533	0	730	366	1,629
<b>Variance:</b>				65,408	204,286	11,149	0	53,612	5,400	124,370
<b>Standard Error:</b>				256	452	106	0	232	73	353
<b>CV (%):</b>				18	17	20	--	32	20	22
<b>95% CI:</b>				955 - 1,958	1,807 - 3,579	326 - 740	--	276 - 1,184	222 - 510	938 - 2,321
Jan - Apr	3	16-Jan	19-Jan	268	523	367	0	486	247	1,100
	4	20-Jan	26-Jan	306	599	247	4	327	162	740
	5	27-Jan	2-Feb	259	489	94	8	125	56	282
	6	3-Feb	9-Feb	48	86	13	0	18	9	40
	7	10-Feb	16-Feb	51	100	22	0	29	15	67
	8	17-Feb	23-Feb	160	317	67	3	88	42	200
	9	24-Feb	2-Mar	59	117	41	0	55	28	123
	10	3-Mar	9-Mar	153	300	47	0	63	32	141
	11	10-Mar	16-Mar	157	294	63	0	83	42	188
	12	17-Mar	23-Mar	305	687	114	3	151	73	341
	13	24-Mar	30-Mar	54	89	9	0	12	6	27
	14	31-Mar	6-Apr	228	444	178	0	236	120	533
	15	7-Apr	13-Apr	471	918	188	0	250	127	565
16	14-Apr	15-Apr	69	121	34	0	45	23	103	
<b>Olympic Peninsula Derby; Feb 15-17</b>				67	132	47	0	62	32	141
<b>January - April Total:</b>				2,655	5,217	1,531	19	2,029	1,013	4,591
<b>Variance:</b>				48,407	218,408	28,841	75	197,038	28,981	419,803
<b>Standard Error:</b>				220	467	170	9	444	170	648
<b>CV (%):</b>				8	9	11	46	22	17	14
<b>95% CI:</b>				2,224 - 3,086	4,301 - 6,133	1,198 - 1,864	2 - 36	1,159 - 2,899	679 - 1,346	3,321 - 5,861
<b>Season Total:</b>				<b>4,111</b>	<b>7,910</b>	<b>2,064</b>	<b>19</b>	<b>2,759</b>	<b>1,379</b>	<b>6,221</b>
<b>Variance:</b>				113,815	422,694	39,990	75	250,650	34,381	544,173
<b>Standard Error:</b>				337	650	200	9	501	185	738
<b>CV (%):</b>				8.2%	8.2%	9.7%	45.6%	18.1%	13.4%	11.9%
<b>95% CI:</b>				3,450 - 4,772	6,636 - 9,184	1,672 - 2,456	2 - 36	1,778 - 3,740	1,016 - 1,742	4,774 - 7,666



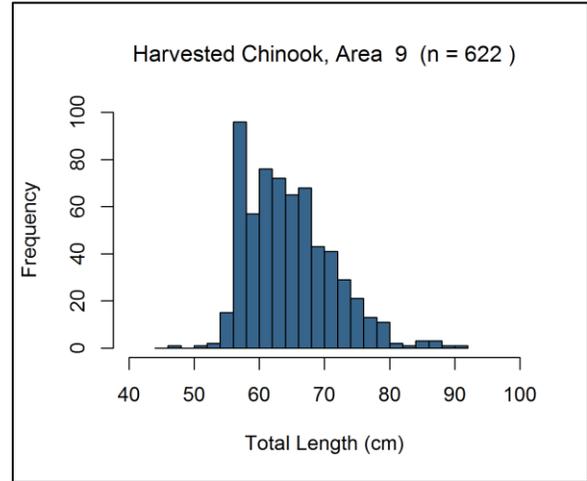
**Figure 4.1** Temporal patterns in fishing effort during the 2013-14 winter Chinook MSF in Marine Area 9.



**Figure 4.3** Temporal patterns in Chinook encounters (number retained and released) during the 2013-14 winter Chinook MSF in Marine Area 9.



**Figure 4.2** Temporal patterns in CPUE (number of Chinook landed per angler trip) during the 2013-14 winter Chinook MSF in Marine Area 9.



**Figure 4.4** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2013-14 winter Chinook MSF in Marine Area 9.

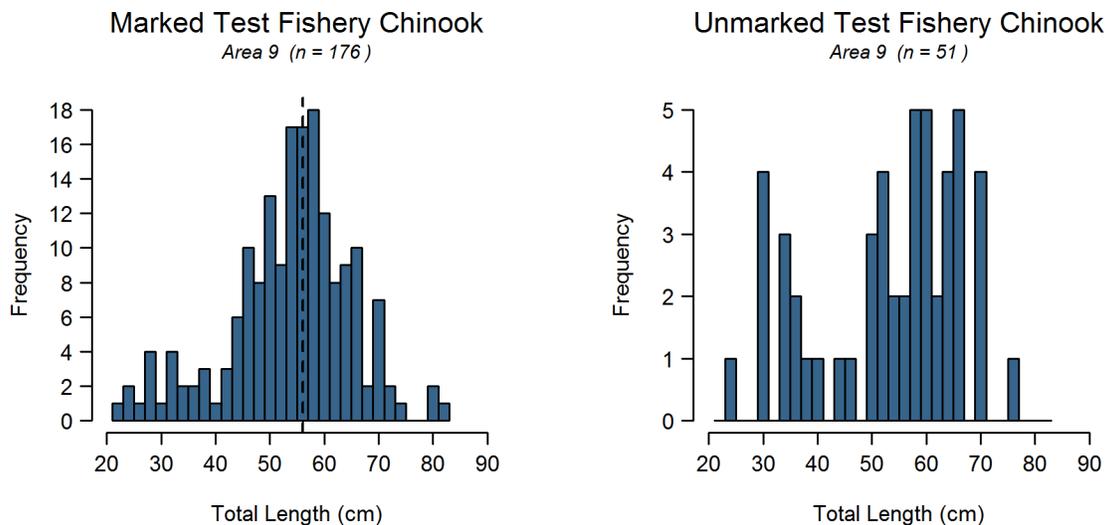
**Table 4.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the Area 9 Chinook MSF from November 1-30, 2013 (*left panel*) and January 16 - April 15, 2014 (*right panel*).

Mark Type	November # Sampled		
	Legal-size	Sublegal-size	Total
Marked	184	3	187
Unmarked	1	0	1
<b>Total</b>	<b>185</b>	<b>3</b>	<b>188</b>

Mark Type	January – April # Sampled		
	Legal-size	Sublegal-size	Total
Marked	420	15	435
Unmarked	0	2	2
<b>Total</b>	<b>420</b>	<b>17</b>	<b>437</b>

**Table 4.4** Summary of CWTs recovered from Chinook salmon harvested during the 2013-14 winter Chinook MSF in Marine Area 9. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
B.C. (3.9%)	Fraser-Thompson River (1.3%)	Chilliwack R	Chilliwack River H	1 (1.3%)	1
	Georgia Strait (2.6%)	Big Qualicum R	Big Qualicum River H	2 (2.6%)	0
WA (94.7%)	N Washington (6.6%)	Friday Cr 03.0017	Samish H	2 (2.6%)	0
		Nooksack R	Kendall Cr H	2 (2.6%)	2
		Boyd Cr 01.0490	Kendall Cr H	1 (1.3%)	0
	Hood Canal (21.1%)	Finch Cr 16.0222	Hoodsport H	11 (14.5%)	0
		Purdy Cr 16.0005	George Adams H	5 (6.6%)	0
	N Puget Sound (19.7%)	Whitehorse Springs	Stillaguamish H	6 (7.9%)	0
		Tulalip Cr 07.0001	Bernie Gobin H	1 (1.3%)	1
		May Cr 07.0943	Wallace R H	1 (1.3%)	0
		Wallace R 07.0940	Wallace R H	7 (9.2%)	0
	Skagit River (3.9%)	Cascade R 03.1411	Marblemount H	3 (3.9%)	1
	Mid Puget Sound (27.6%)	Icy Cr 09.0125	Icy Cr H	8 (10.5%)	0
		Voight Cr Tr 10.0428	Voights Cr H	1 (1.3%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	2 (2.6%)	0
		Grovers Cr Hatchery	Grovers Cr H	9 (11.8%)	1
		Palmer Hatchery	Keta Creek Complex	1 (1.3%)	0
	S Puget Sound (15.8%)	Clear Cr 11.0013C	Clear Creek H	1 (1.3%)	0
		Minter Cr 15.0048	Minter Cr H	11 (14.5%)	0
Col River (1.3%)	Lower Col River (1.3%)	Fallert Cr 27.0017	Fallert Cr H	1 (1.3%)	0
<b>Total</b>				<b>76</b>	<b>6</b>



**Figure 4.5** Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook encountered by test fishers during the 2013-14 winter Chinook MSF in Marine Area 9. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).

**Table 4.5** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the 2013-14 winter Chinook MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Month	Stat Week	Fishing Effort		Legal		Sublegal		Total	
		Days	Hours Fished	AD	UM	AD	UM		
Nov	44	2	10.6	7	1	0	0	8	
	45	2	9.0	3	1	4	4	12	
	46	2	11.3	4	2	7	0	13	
	47	5	21.7	8	4	6	2	20	
	48	1	3.0	0	0	1	0	1	
	<b>Total</b>	<b>12</b>	<b>55.6</b>	<b>22</b>	<b>8</b>	<b>18</b>	<b>6</b>	<b>54</b>	
	<b>Size/mark-status composition:</b>				0.41 (0.0046)	0.15 (0.0024)	0.33 (0.0042)	0.11 (0.0019)	
<b>Legal size mark rate:</b>				0.73 (0.0067)					
<b>Overall mark rate:</b>				0.74 (0.0036)					
Jan - Apr	3	3	15.1	12	3	7	1	23	
	4	4	19.9	12	2	3	6	23	
	5	4	18.8	2	3	6	2	13	
	6	6	22.4	4	1	7	4	16	
	7	3	14.5	3	3	11	0	17	
	8	4	16.5	5	2	7	0	14	
	9	1	4.5	1	0	0	0	1	
	10	4	21.1	3	1	6	1	11	
	11	4	17.7	0	1	4	1	6	
	12	3	12.7	7	1	7	0	15	
	13	3	14.8	0	0	4	1	5	
	14	5	24.1	11	3	12	1	27	
	15	1	3.5	2	0	0	0	2	
	<b>Total</b>	<b>45</b>	<b>205.5</b>	<b>62</b>	<b>20</b>	<b>74</b>	<b>17</b>	<b>173</b>	
	<b>Size/mark-status composition:</b>				0.36 (0.0013)	0.12 (0.0006)	0.43 (0.0014)	0.10 (0.0005)	
<b>Legal size mark rate:</b>				0.76 (0.0023)					
<b>Overall mark rate:</b>				0.79 (0.0010)					
Season Total	<b>Grand Total</b>	<b>57</b>	<b>261.1</b>	<b>84</b>	<b>28</b>	<b>92</b>	<b>23</b>	<b>227</b>	
	<b>Size/mark-status composition<sup>1</sup>:</b>				0.37 (0.0010)	0.12 (0.0005)	0.41 (0.0011)	0.10 (0.0004)	
	<b>Legal size mark rate:</b>				0.75 (0.0017)				
	<b>Overall mark rate:</b>				0.78 (0.0008)				

<sup>1</sup> Note: Results of a Chi-Square test between Nov and Jan-Apr size/mark-status proportions suggest no significant difference. Therefore, encounters from the two time periods were combined and season total proportions were used to estimate total Chinook encounters and associated impacts.

**Table 4.6** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2013-14 winter Chinook MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
<b>November 1-30, 2013</b>								
Private Boat VTR	56 1-trip VTRs, 106 Angler Trips	72	13	63	23	171	0.79	0.85
November size/mark-status composition:		0.42	0.08	0.37	0.13			
Variance:		(0.0014)	(0.0004)	(0.0014)	(0.0007)			
<b>January 16 - April 15, 2014</b>								
Private Boat VTR	261 1-trip VTRs, 522 Angler Trips	367	85	198	35	685	0.82	0.81
Jan-April size/mark-status composition:		0.54	0.12	0.29	0.05			
Variance:		(0.0004)	(0.0002)	(0.0003)	(0.0001)			

We used Pearson’s chi-square test to compare size/mark-status proportions in the test fishery between two separate time periods during the Area 9 winter MSF season (Nov. 1-30 vs. Jan 16-Apr 15). Results indicated no significant difference in proportions between the two time strata ( $\chi^2 = 1.593$ ,  $df = 3$ ,  $p\text{-value} = 0.661$ ), suggesting that they may be combined. We next compared private fleet VTR data between each time period. Results of the Pearson chi-square analysis indicated a significant difference in VTR proportions between the two time periods ( $\chi^2 = 23.15$ ,  $df = 3$ ,  $p\text{-value} < 0.01$ ). Given these results, we elected to use the combined season total set of test fishery data only to calculate encounter and mortality estimates for the Area 9 winter MSF.

**Table 4.7** Summary of season-wide fishery impact estimates for the 2013-14 winter Chinook MSF in Marine Area 9. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

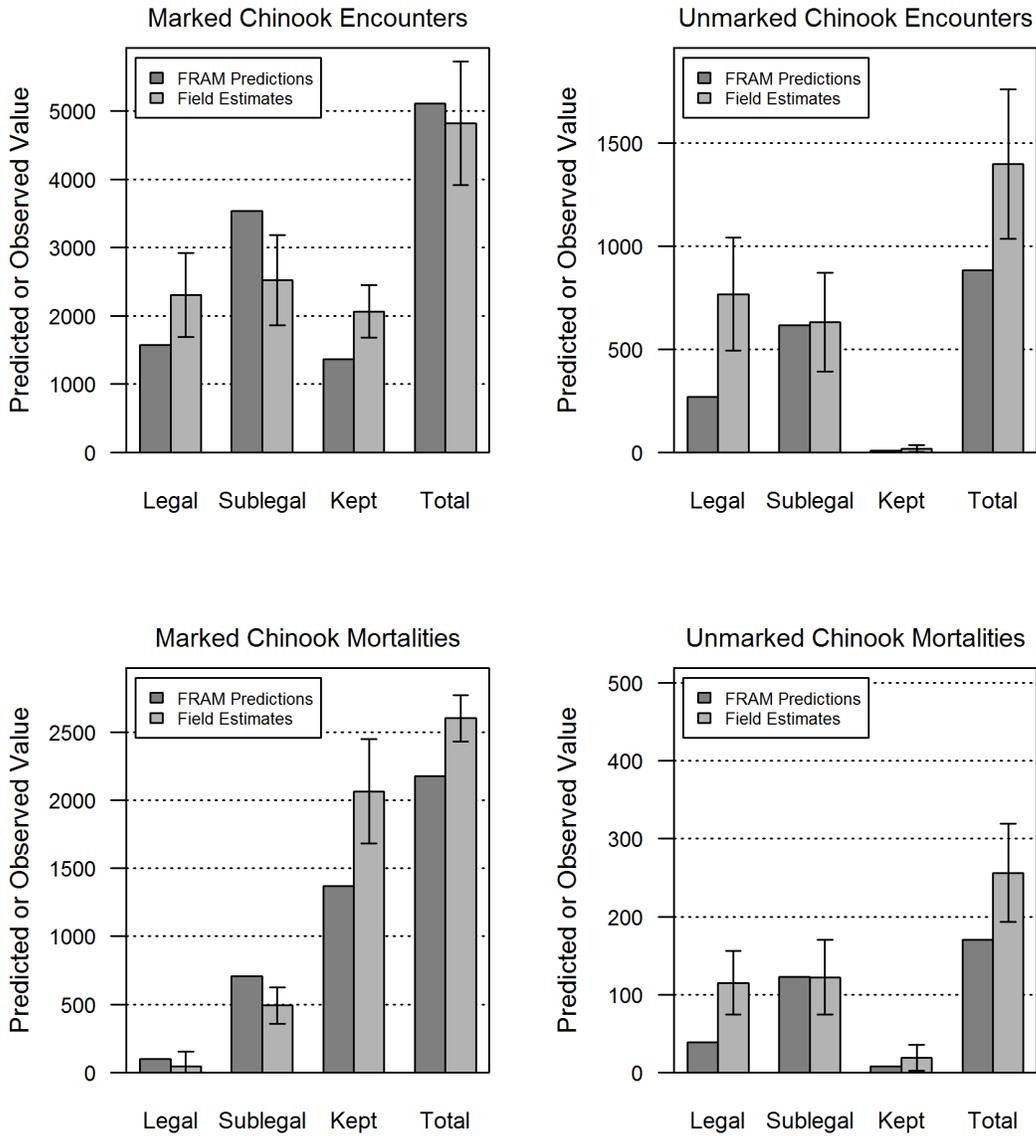
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	2,302	2,003	299	45	2,048	40,937	202	1,651 - 2,444	10
Legal UM	767	0	767	115	115	436	21	74 - 156	18
Sublegal AD	2,521	61	2,460	492	553	4,801	69	418 - 689	13
Sublegal UM	630	19	611	122	141	675	26	90 - 192	18
<b>Total</b>	<b>6,221</b>	<b>2,083</b>	<b>4,138</b>	<b>774</b>	<b>2,857</b>	<b>46,849</b>	<b>216</b>	<b>2,433 - 3,281</b>	<b>8</b>

**Table 4.8** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters for the 2013-14 winter Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	883	268	615	8
	AD	5,109	1,574	3,535	1,369
	Total	5,992	1,842	4,150	1,377
	% Marked	85	85	85	99
Estimated (Creel) Encounters	UM	1,398	767	630	19
	AD	4,823	2,302	2,521	2,064
	Total	6,221	3,069	3,151	2,083
	% Marked	78	75	80	99

**Table 4.9** Comparison of modeled (FRAM model run 1213) and estimated total Chinook mortalities for the 2013-14 winter Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	170	2,175	2,345	256	2,601	2,857
Released Legal	39	99	138	115	45	160
Released Sublegal	123	707	830	122	492	614
Landed Only	8	1,369	1,377	19	2,064	2,083



**Figure 4.6** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters and mortalities for the 2013-14 winter Chinook MSF in Marine Area 9. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 4.10** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2013-14 winter Chinook MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Bernie Gobin Hatchery	2010	1	3.3	7.77	3.3	0.3	0.078	0.28
Grovers Creek Hatchery	2010	1	3.3	7.77	3.3	0.3	0.077	0.28
Chilliwack River Hatchery	2011	1	3.3	7.77	1.7	0.2	0.020	0.14
Kendall Creek Hatchery	2010	2	6.7	15.55	6.5	0.6	0.146	0.54
Marblemount Hatchery	2010	1	3.3	7.77	3.6	0.4	0.091	0.30
<b>Total</b>		<b>6</b>	<b>20.0</b>	<b>46.65</b>	<b>18.4</b>	<b>1.8</b>	<b>0.411</b>	<b>1.54</b>

**Table 4.11** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) in the 2013-14 winter Chinook MSF in Marine Area 9.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
November	44 - 48	1 Nov - 30 Nov	533	0	533	187	1	188	35.3%
January	3 - 5	16 Jan - 2 Feb	708	12	720	224	1	225	31.3%
February	6 - 9	3 Feb - 2 Mar	190	3	194	53	1	54	27.8%
March	10 - 13	3 Mar - 30 Mar	232	3	236	57	0	57	24.2%
April	14 - 16	31 Mar - 15 Apr	400	0	400	101	0	101	25.3%
<b>Season Total</b>			<b>2,063</b>	<b>18</b>	<b>2,083</b>	<b>622</b>	<b>3</b>	<b>625</b>	<b>30.0%</b>

<sup>1/</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWTs, from all sites sampled during the winter 2013-14 Area 9 Chinook MSF (the sample-frame sites included in the creel estimates and the fish sampled as part of derbies and other baseline sampling in the Area).

**Table 4.12** Fishery-total estimates of retained and released salmon (*other than Chinook*) during the 2013-14 winter Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status.

Week	Start Date	End Date	Retained Salmon			Released Salmon					
			Coho AD	Coho UM	Chum	Coho AD	Coho UM	Coho UK	Chum	Cutthroat Trout	Unk Salmon
44	1-Nov	3-Nov	4	36	69	7	0	0	25	11	55
45	4-Nov	10-Nov	0	43	33	12	0	15	0	0	98
46	11-Nov	17-Nov	0	36	26	4	0	4	0	0	33
47	18-Nov	24-Nov	3	0	3	0	21	8	0	0	47
48	25-Nov	30-Nov	0	0	4	0	14	5	0	0	22
3	16-Jan	19-Jan	0	0	0	7	0	0	0	0	0
4	20-Jan	26-Jan	0	0	0	0	0	0	0	0	11
5	27-Jan	2-Feb	0	0	0	3	3	0	0	0	4
6	3-Feb	9-Feb	0	0	0	0	0	0	0	0	0
7	10-Feb	16-Feb	0	0	0	0	0	0	0	0	20
8	17-Feb	23-Feb	0	0	0	0	0	0	0	0	0
9	24-Feb	2-Mar	0	0	0	0	0	0	0	0	0
10	3-Mar	9-Mar	0	0	0	3	0	0	0	0	0
11	10-Mar	16-Mar	0	0	0	0	0	0	0	0	0
12	17-Mar	23-Mar	0	0	0	3	0	0	0	0	3
13	24-Mar	30-Mar	0	0	0	0	0	0	0	0	0
14	31-Mar	6-Apr	0	0	0	0	0	0	0	0	0
15	7-Apr	13-Apr	0	0	0	0	0	3	0	0	0
16	14-Apr	15-Apr	0	0	0	0	0	0	0	0	0
<b>Season Total:</b>			<b>7</b>	<b>115</b>	<b>136</b>	<b>40</b>	<b>38</b>	<b>35</b>	<b>25</b>	<b>11</b>	<b>295</b>
<b>Variance:</b>			10	4,449	3,490	133	638	146	258	47	3,220
<b>Standard Error:</b>			3	67	59	11.5	25.3	12.1	16.1	6.9	56.7
<b>CV (%):</b>			45%	58%	44%	29%	66%	35%	64%	62%	19%
<b>95% CI:</b>			1-13	0 - 245	20 - 252	17 - 63	0 - 88	11 - 59	0 - 56	0 - 24	184 - 406

**Table 4.13** Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the four-site sample frame during the 2013-14 winter Chinook MSF in Marine Area 9. See Methods Report (WDFW 2012a) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, $f_{ij}$
		Start Time	End Time	Total Boats, $m_{ij}$	Total Boats, $Sy_{ijk}$	Sampled Boats	Active Boats, $X_{ij}$	
1-Nov	Weekend	11:03	11:33	104	145.1	53	38	0.365
22-Nov	Weekend	9:56	10:27	35	56.0	16	10	0.286
24-Nov	Weekend	9:33	10:20	90	105.5	68	58	0.644
30-Nov	Weekend	9:31	10:11	44	74.0	37	22	0.500
<b>November Summary Statistics</b>		<b>Totals</b>		<b>273</b>	<b>381</b>	<b>174</b>	<b>128</b>	
		<b>Mean</b>		<b>68</b>	<b>95</b>	<b>44</b>	<b>32</b>	<b>0.449</b>
		<b>St Dev</b>		<b>33.9</b>	<b>39.1</b>	<b>22.3</b>	<b>20.8</b>	<b>0.158</b>
		<b>CV(%)</b>		<b>50%</b>	<b>41%</b>	<b>51%</b>	<b>65%</b>	<b>35%</b>
24-Jan	Weekend	13:01	13:40	18	39.6	22	10	0.556
28-Jan	Weekend	9:38	10:01	12	19.2	8	5	0.417
31-Jan	Weekend	11:00	11:29	23	26.3	16	14	0.609
1-Feb	Weekend	9:42	10:23	97	117.8	51	42	0.433
20-Feb	Weekday	10:30	10:51	14	21.0	3	2	0.143
21-Feb	Weekend	9:38	10:05	19	33.3	14	8	0.421
22-Feb	Weekend	9:35	10:08	54	57.9	30	28	0.519
28-Feb	Weekend	10:20	10:46	13	17.3	12	9	0.692
7-Mar	Weekend	10:13	10:36	19	22.8	12	10	0.526
15-Mar	Weekend	9:53	10:23	24	30.9	9	7	0.292
22-Mar	Weekend	9:12	9:59	101	129.9	72	56	0.554
31-Mar	Weekday	10:22	10:44	24	36.0	12	8	0.333
12-Apr	Weekend	9:52	10:39	80	103.8	48	37	0.463
<b>Jan - Apr Summary Statistics</b>		<b>Totals</b>		<b>498</b>	<b>656</b>	<b>309</b>	<b>236</b>	
		<b>Mean</b>		<b>38</b>	<b>50</b>	<b>24</b>	<b>18</b>	<b>0.458</b>
		<b>St Dev</b>		<b>33.0</b>	<b>39.8</b>	<b>20.7</b>	<b>17.0</b>	<b>0.145</b>
		<b>CV(%)</b>		<b>86%</b>	<b>79%</b>	<b>87%</b>	<b>93%</b>	<b>32%</b>

**Table 4.14** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 9 Winter Chinook MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jan 16 - Apr 15, 2008	6,887	1,333	3	72	0	195	304	1,288	375	3,570
Nov 1-30, 2008 & Jan 16 - Apr 15, 2009	7,064	871	14	14	0	130	158	3,520	2,837	7,545
Nov 1-30, 2009 & Jan 16 - Apr 15, 2010	6,823	1,450	18	106	10	217	353	2,166	615	4,934
Nov 1-30, 2010 & Jan 16 - Apr 15, 2011	4,425	428	0	3	0	64	117	583	422	1,618
Nov 1-30, 2011 & Jan 16 - Apr 15, 2012	4,361	421	0	34	3	63	140	1,433	548	2,642
Nov 1-30, 2012 & Jan 16 - Apr 15, 2013	6,801	1,504	0	31	18	225	469	2,617	986	5,849
Nov 1-30, 2013 & Jan 16 - Apr 15, 2014	7,910	2,003	0	61	19	299	767	2,460	611	6,221

## **5) Marine Area 10 Winter Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented a seventh consecutive winter Chinook MSF in Marine Area 10 from October 1, 2013 through January 31, 2014. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 10 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, test fishing and collection of VTRs from the angling public. **Table 5.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In the following section we present results from our monitoring activities during the Area 10 winter Chinook MSF from October 1, 2013 through January 31, 2014.

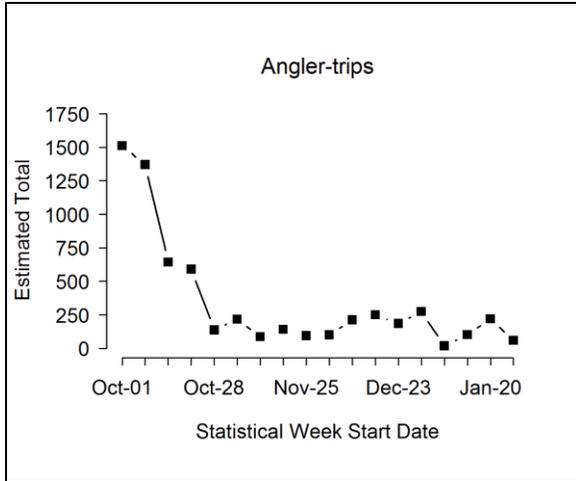
**Table 5.1** Sampling/estimation details on target parameters associated with the overall Area 10 winter Chinook MSF monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release.	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum, we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum, we sampled $n=2$ days out of $N=3$ available weekend days per week.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site “size measures”) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 7 boat surveys were conducted during the four-month fishery. The results of these surveys were incorporated into multi-year site-weight averages.
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season (4 months)	Season-total size/mark-status proportions from the test fishery data were used to estimate total Chinook encounters and associated impacts; LM=13%, LU=4%, SM=63%, SU=20%. (See <b>Tables 5.5 and 5.6</b> ).
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., Coho) that the angler may record on the VTR form	Fish encounter	Season (4 months)	VTR data ( <b>Table 5.6</b> ) were not used for impact estimation steps due to the assumed higher data quality and sufficient sample size of the test fishery data. See comment in row above.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season (4 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (4 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

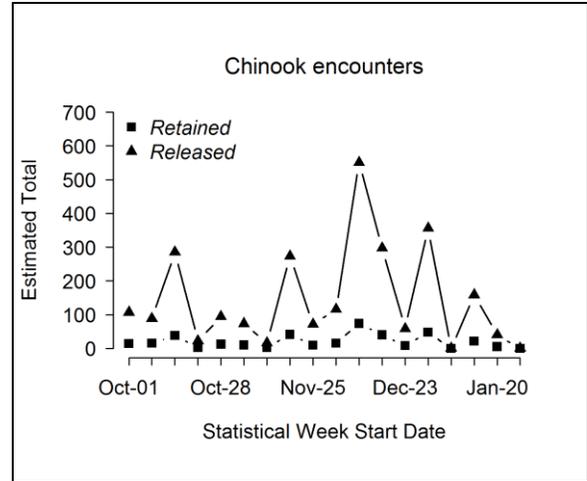
<sup>1</sup>The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.<sup>2</sup>Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

**Table 5.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2013-14 winter Chinook MSF in Marine Area 10. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

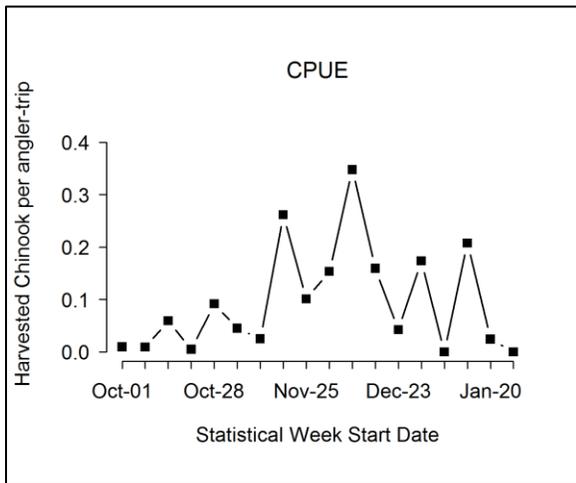
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Oct	40	1-Oct	6-Oct	826	1512	14	0	78	29	121
	41	7-Oct	13-Oct	751	1370	12	3	66	22	103
	42	14-Oct	20-Oct	333	643	38	0	207	78	323
	43	21-Oct	27-Oct	324	590	3	0	16	6	25
Nov	44	28-Oct	3-Nov	106	137	13	0	69	26	107
	45	4-Nov	10-Nov	131	218	10	0	53	20	83
	46	11-Nov	17-Nov	41	86	2	0	12	4	18
	47	18-Nov	24-Nov	73	142	37	4	201	72	314
Dec	48	25-Nov	1-Dec	47	95	10	0	52	20	81
	49	2-Dec	8-Dec	48	101	15	0	84	31	131
	50	9-Dec	15-Dec	106	212	74	0	401	150	625
	51	16-Dec	22-Dec	121	250	40	0	216	81	337
	52	23-Dec	29-Dec	108	185	8	0	43	16	66
Jan	53/1	30-Dec	5-Jan	142	275	48	0	259	97	404
	2	6-Jan	12-Jan	13	19	0	0	0	0	0
	3	13-Jan	19-Jan	65	102	21	0	115	43	180
	4	20-Jan	26-Jan	131	219	5	0	29	11	45
	5	27-Jan	31-Jan	37	60	0	0	0	0	0
<b>Season Total:</b>				<b>3,404</b>	<b>6,216</b>	<b>350</b>	<b>7</b>	<b>1,901</b>	<b>706</b>	<b>2,964</b>
<b>Variance:</b>				135,407	415,170	5,952	15	316,945	37,119	717,758
<b>SE:</b>				368	644	77	4	563	193	847
<b>CV (%):</b>				11	10	22	55	30	27	29
<b>95% CI:</b>				2,683 - 4,126	4,953 - 7,479	199 - 501	0 - 15	798 - 3,004	328 - 1,084	1,304 - 4,625



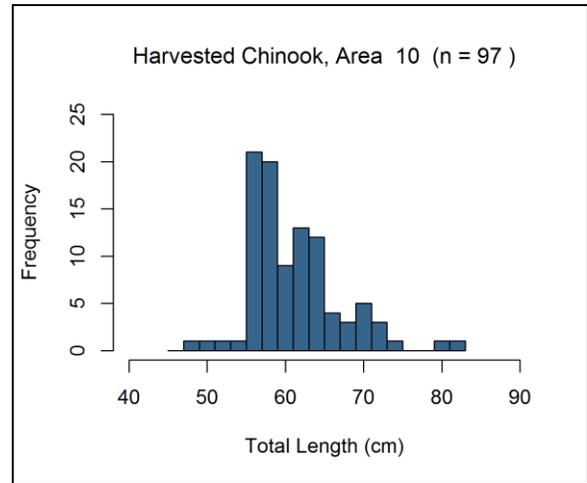
**Figure 5.1** Temporal patterns in fishing effort during the 2013-14 winter Chinook MSF in Marine Area 10.



**Figure 5.3** Temporal patterns in Chinook encounters (number retained and released) during the 2013-14 winter Chinook MSF in Marine Area 10.



**Figure 5.2** Temporal patterns in CPUE (number of Chinook landed per angler trip) during the 2013-14 winter Chinook MSF in Marine Area 10.



**Figure 5.4** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2013-14 winter Chinook MSF in Marine Area 10.

**Table 5.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2013-14 winter Chinook MSF in Marine Area 10.

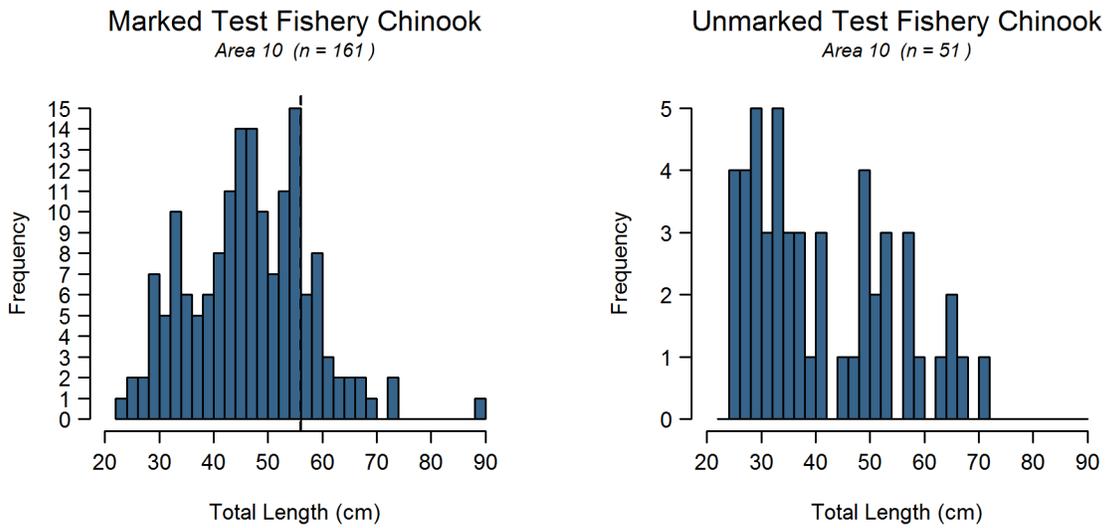
Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	91	6	97
Unmarked	1	1	2
<b>Total</b>	<b>92</b>	<b>7</b>	<b>99</b>

**Table 5.4** Summary of CWTs recovered from Chinook salmon harvested during the 2013-14 winter Chinook MSF in Marine Area 10. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
B.C. (6.2%)	Fraser-Thompson River (6.2%)	Chilliwack R	Chilliwack River H	1 (6.2%)	1
WA (93.8%)	Hood Canal (18.8%)	Purdy CR 16.0005	George Adams H	1 (6.2%)	0
		Finch CR 16.0222	Hoodsport H	2 (12.5%)	0
	N Puget Sound (25%)	Wallace R 07.0940	Wallace R H	1 (6.2%)	0
		Whitehorse Springs	Stillaguamish H	3 (18.8%)	0
	Mid Puget Sound (43.8%)	Icy Cr 09.0125	Icy Cr H	3 (18.8%)	0
		Voight Cr 10.0414	Voights Cr H	3 (18.8%)	0
		White R 10.0031	White R H	1 (6.2%)	0
	S Puget Sound (6.2%)	Minter Cr 15.0048	Minter Cr H	1 (6.2%)	0
<b>Total</b>				<b>16</b>	<b>1</b>

**Table 5.5** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the 2013-14 winter Chinook MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hours Fished	AD	UM	AD	UM	
40	2	6.6	0	0	5	2	7
41	5	20.4	5	3	15	4	27
42	4	19.7	1	1	9	5	16
43	3	9.5	4	1	9	4	18
44	1	9.2	1	0	4	1	6
45	1	3.0	0	1	2	0	3
46	0	0.0	0	0	0	0	0
47	2	6.1	1	0	3	0	4
48	0	0.0	0	0	0	0	0
49	3	7.2	1	0	7	2	10
50	2	6.0	5	1	17	2	25
51	5	18.4	3	1	19	6	29
52	2	7.5	0	0	9	2	11
53/1	4	14.8	3	0	11	8	22
2	4	17.2	1	1	15	4	21
3	3	13.6	2	0	9	2	13
4	0	0.0	0	0	0	0	0
5	0	0.0	0	0	0	0	0
<b>Total</b>	<b>41</b>	<b>159.2</b>	<b>27</b>	<b>9</b>	<b>134</b>	<b>42</b>	<b>212</b>
<b>Size/mark-status composition:</b>		0.13 (0.001)	0.04 (0.000)	0.63 (0.001)	0.20 (0.001)		
<b>Legal size mark rate:</b>		0.75 (0.005)					
<b>Overall mark rate:</b>		0.76 (0.001)					



**Figure 5.5** Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook encountered by test fishers during the 2013-14 winter Chinook MSF in Marine Area 10. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).

**Table 5.6** Total Chinook encountered (retained and released) by private-boat and charter boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2013-14 winter Chinook MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	38 1-trip VTRs, 60 Angler Trips	14	2	76	30	122	0.74	0.88
Size/mark-status composition:		0.11	0.02	0.62	0.25			
Variance:		(0.0008)	(0.0001)	(0.0019)	(0.0015)			

We used Pearson’s chi-square test to compare the size/mark-status composition of the private VTR and test fishery datasets. Results were not significant ( $\chi^2 = 2.53$ ,  $df = 3$ ,  $p\text{-value} = 0.47$ ), suggesting that the two datasets can be combined into one pooled season-total estimate of size/mark-status proportions. However, even though there was no significant difference between the two datasets, we elected to use only the test fishing data to calculate encounter and mortality estimates, as it is assumed to be of higher quality and sample sizes were sufficient.

**Table 5.7** Summary of season-wide fishery impact estimates for the 2013-14 winter Chinook MSF in Marine Area 10. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

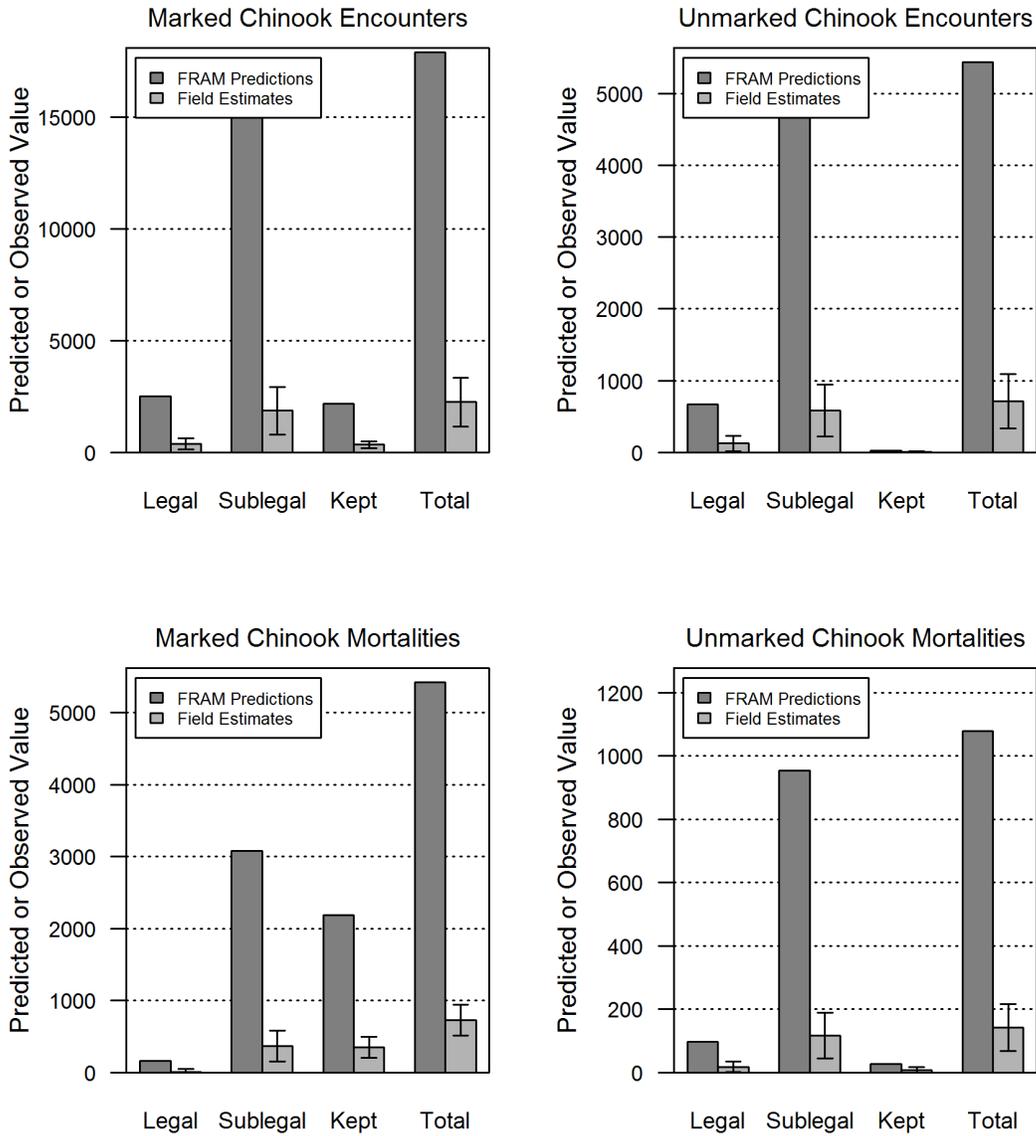
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	378	328	49	7	336	5,786	76	187 - 485	23
Legal UM	126	4	122	18	22	77	9	5 - 39	40
Sublegal AD	1,874	22	1,852	370	392	11,923	109	178 - 606	28
Sublegal UM	587	4	584	117	120	1,383	37	47 - 193	31
<b>Total</b>	<b>2,964</b>	<b>357</b>	<b>2,607</b>	<b>513</b>	<b>870</b>	<b>19,169</b>	<b>138</b>	<b>599 - 1,141</b>	<b>16</b>

**Table 5.8** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters for the 2013-14 winter Chinook MSF in Marine Area 10. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	5,437	667	4,770	27
	AD	17,899	2,514	15,385	2,187
	Total	23,336	3,181	20,155	2,214
	% Marked	77	79	76	99
Estimated (Creel) Encounters	UM	713	126	587	7
	AD	2,251	378	1,874	350
	Total	2,964	503	2,461	357
	% Marked	76	75	76	98

**Table 5.9** Comparison of modeled (FRAM model run 1213) and estimated total Chinook mortalities for the 2013-14 winter Chinook MSF in Marine Area 10. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	1,078	5,423	6,501	142	728	870
Released Legal	97	159	256	18	7	26
Released Sublegal	954	3,077	4,031	117	370	487
Landed Only	27	2,187	2,214	7	350	357



**Figure 5.6** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters and mortalities for the 2013-14 winter Chinook MSF in Marine Area 10. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 5.10** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2013-14 winter Chinook MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Chilliwack River Hatchery	2011	1	3.6	9.41	1.8	0.2	0.024	0.15
<b>Total</b>		<b>1</b>	<b>3.6</b>	<b>9.41</b>	<b>1.8</b>	<b>0.2</b>	<b>0.024</b>	<b>0.15</b>

**Table 5.11** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) in the 2013-14 winter Chinook MSF in Marine Area 10.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
October	40 - 44	01 Oct - 03 Nov	80	3	83	29	1	30	36.0%
November	45 - 48	04 Nov - 01 Dec	59	4	63	25	1	26	41.5%
December	49 - 52	02 Dec - 29 Dec	137	0	137	27	0	27	19.7%
January	53.1 - 5	30 Dec - 31 Jan	74	0	74	16	0	16	21.5%
<b>Season Total</b>			<b>350</b>	<b>7</b>	<b>357</b>	<b>97</b>	<b>2</b>	<b>99</b>	<b>27.7%</b>

<sup>1</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWTs, from all sites sampled during the four-month winter Area 10 fishery (i.e., the two selected sites per sampling day for creel [Murthy] estimates, plus the fish sampled as part of baseline [non-Murthy] sampling in the Area).

**Table 5.12** Fishery-total estimates of retained and released salmon (*other than Chinook*) during the 2013-14 winter Chinook MSF in Marine Area 10. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status.

Stat Week	Start Date	End Date	Retained Salmon			Released Salmon						
			Coho AD	Coho UM	Chum	Coho AD	Coho UM	Coho UK	Chum	Pink	Cutthroat Trout	Unk Salmon
40	1-Oct	6-Oct	234	567	10	27	36	193	3	0	12	525
41	7-Oct	13-Oct	138	430	19	16	24	292	0	0	0	823
42	14-Oct	20-Oct	0	93	52	4	40	46	0	12	31	412
43	21-Oct	27-Oct	0	61	15	0	40	57	0	0	0	351
44	28-Oct	3-Nov	0	9	19	0	0	0	17	0	0	113
45	4-Nov	10-Nov	0	0	31	0	3	18	3	0	0	119
46	11-Nov	17-Nov	0	0	0	0	0	0	0	0	0	45
47	18-Nov	24-Nov	0	0	0	0	0	0	0	0	0	0
48	25-Nov	1-Dec	0	0	0	0	0	0	0	0	0	0
49	2-Dec	8-Dec	0	0	0	0	2	4	0	0	0	0
50	9-Dec	15-Dec	0	0	0	12	0	0	0	0	4	93
51	16-Dec	22-Dec	0	0	0	12	0	0	0	0	0	92
52	23-Dec	29-Dec	0	0	0	0	14	0	0	0	0	17
53/1	30-Dec	5-Jan	0	0	0	0	0	0	0	0	0	29
2	6-Jan	12-Jan	0	0	0	0	0	0	0	0	0	8
3	13-Jan	19-Jan	0	0	0	0	0	0	0	0	0	50
4	20-Jan	26-Jan	0	0	0	0	0	0	0	0	0	0
5	27-Jan	31-Jan	0	0	0	0	0	0	0	0	0	0
<b>Area 10 Season Total:</b>			<b>371</b>	<b>1,159</b>	<b>146</b>	<b>70</b>	<b>159</b>	<b>611</b>	<b>23</b>	<b>12</b>	<b>47</b>	<b>2,676</b>
<b>Variance:</b>			2,990	47,112	1,395	602	6,858	61,165	249	76	621	237,639
<b>Standard Error:</b>			55	217	37	25	83	247	16	9	25	487
<b>CV (%):</b>			15	19	26	35	52	40	68	76	53	18
<b>95% CI:</b>			264 - 478	734 - 1,584	72 - 219	22 - 118	0 - 321	126 - 1,096	0 - 54	0 - 29	0 - 96	1,721 - 3,631

**Table 5.13** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2013-14 winter Chinook MSF in Marine Area 10. Bold sites indicate those included in the dockside sample frame.

Site Name	Total Anglers (less 'Tengu' Derby anglers) <sup>1</sup>	Season Total (unadjusted) Size Measure	Total Anglers (with 'Tengu' Derby anglers) <sup>1</sup>	Season Total (unadjusted) Size Measure
<b>Armeni Public Ramp</b>	<b>41</b>	0.156	<b>103</b>	0.253
Brownsville Marina	4	0.015	8	0.020
Driftwood Key Marina	0	0.000	2	0.005
Eagle Harbor WP	1	0.004	5	0.012
Edmonds Boat Basin	8	0.031	8	0.020
<b>Edmonds Dry Storage</b>	<b>21</b>	0.080	<b>23</b>	0.057
Edmonds Guest Dock	2	0.008	2	0.005
Edmonds Marina	32	0.122	44	0.108
Elliott Bay Marine	8	0.031	20	0.049
Everett Marina	0	0.000	3	0.007
Harbor Island Marina	3	0.011	3	0.007
Harper Ramp	0	0.000	2	0.005
Keyport Ramp	2	0.008	2	0.005
Kingston Marina	2	0.008	2	0.005
<b>Kingston Public Ramp</b>	<b>14</b>	0.053	<b>17</b>	0.042
Langley Marina/Ramp	2	0.008	2	0.005
<b>Manchester Public Ramp</b>	<b>10</b>	0.038	<b>10</b>	0.025
Point Defiance Boathouse	1	0.004	1	0.002
Port Orchard Marina	1	0.004	1	0.002
Private	15	0.057	36	0.088
Shilshole Marina	21	0.080	26	0.064
<b>Shilshole Public Ramp</b>	<b>71</b>	0.271	<b>84</b>	0.206
Winslow Marina	3	0.011	3	0.007
<b>Area 10 Total Anglers</b>	<b>262</b>	<b>1</b>	<b>407</b>	<b>1</b>

<sup>1</sup> See WDFW 2012a for detailed methods descriptions on calculating Area 10 site size measures during the Tengu Derby period (Tengu Derby occurs on Sundays only, extending from the middle of October through late December).

**Table 5.14** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 10 Winter Chinook MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Dec 1, 2007 - Jan 31, 2008	2,544	539	21	96	0	80	163	1,860	361	3,120
Dec 1, 2008 - Jan 31, 2009	2,029	247	0	4	0	37	36	1,010	462	1,796
Oct 1, 2009 - Jan 31 2010	5,560	354	2	42	0	53	83	2,531	898	3,962
Oct 1, 2010 - Jan 31, 2011	4,461	150	0	13	0	22	53	814	740	1,792
Oct 1, 2011 - Jan 31, 2012	4,615	227	5	15	9	34	183	2,870	1,230	4,573
Oct 1, 2012 - Jan 31, 2013	5,321	121	0	0	0	18	27	1,183	549	1,897
Oct 1, 2013 - Jan 31, 2014	6,216	328	4	22	4	49	122	1,852	584	2,964

## **6) Marine Area 11 Winter Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented a fifth consecutive winter Chinook MSF in Marine Area 11 from February 1 through April 30, 2014. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 11 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, and collection of VTRs from the angling public. **Table 6.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In the following section we present results from our monitoring activities during the Area 11 winter Chinook MSF from February 1 through April 30, 2014.

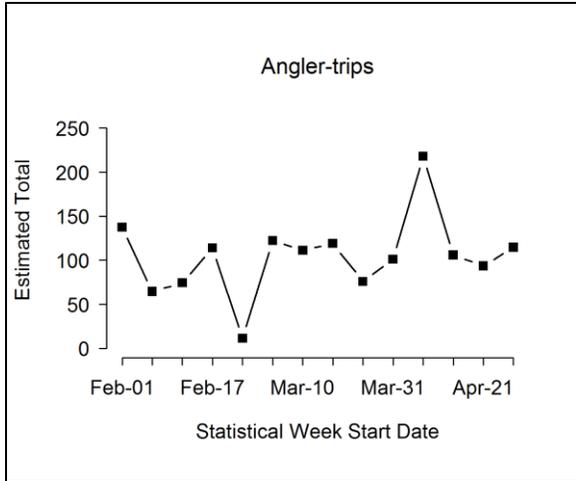
**Table 6.1** Sampling/estimation details on target parameters associated with the overall Area 11 winter Chinook MSF monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum, we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum, we sampled $n=2$ days out of $N=3$ available weekend days per week.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site “size measures”) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 6 boat surveys were conducted during the three-month fishery. The results of these surveys were incorporated into multi-year site-weight averages.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., Coho) that the angler may record on the VTR form	Fish encounter	Season (3 months)	VTR data were used in the estimation of total Area 11 Chinook encounters by size/mark group (LM=54%, LU=17%, SM=27%, SU=2%; <b>Table 6.5</b> ) and associated impacts.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season (3 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (3 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

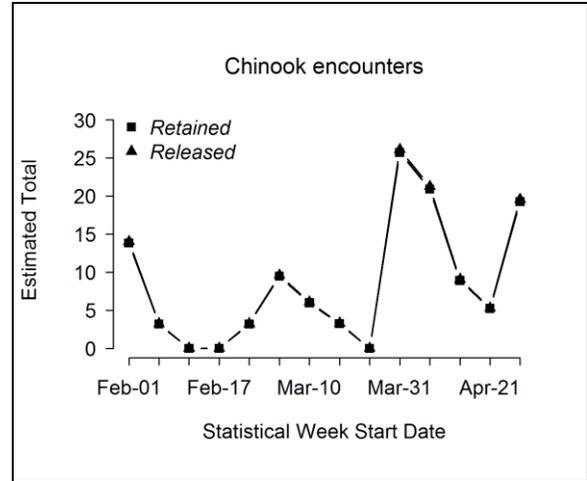
<sup>1</sup>The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

**Table 6.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2013-14 winter Chinook MSF in Marine Area 11. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

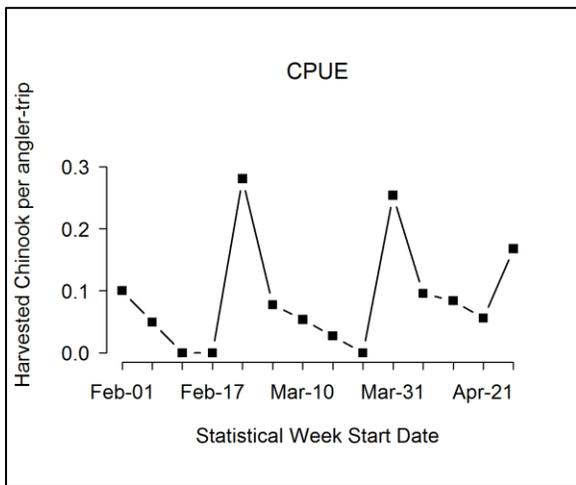
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
<b>Feb</b>	5	1-Feb	2-Feb	91	137	14	0	9	5	28
	6	3-Feb	9-Feb	32	64	3	0	2	1	6
	7	10-Feb	16-Feb	44	74	0	0	0	0	0
	8	17-Feb	23-Feb	68	114	0	0	0	0	0
	9	24-Feb	2-Mar	19	11	3	0	2	1	6
<b>Mar</b>	10	3-Mar	9-Mar	93	122	9	0	6	4	19
	11	10-Mar	16-Mar	70	111	6	0	4	2	12
	12	17-Mar	23-Mar	76	119	3	0	2	1	7
	13	24-Mar	30-Mar	61	76	0	0	0	0	0
	14	31-Mar	6-Apr	72	101	26	0	16	10	52
<b>Apr</b>	15	7-Apr	13-Apr	134	218	21	0	13	8	42
	16	14-Apr	20-Apr	67	106	9	0	6	4	18
	17	21-Apr	27-Apr	50	94	5	0	3	2	11
	18	28-Apr	30-Apr	85	115	19	0	12	8	39
<b>Season Total:</b>				<b>963</b>	<b>1,464</b>	<b>119</b>	<b>0</b>	<b>74</b>	<b>47</b>	<b>240</b>
<b>Variance:</b>				6,978	15,631	765	0	2,916	351	4,451
<b>SE:</b>				84	125	28	--	54	19	67
<b>CV (%):</b>				9	9	23	--	73	40	28
<b>95% CI:</b>				799 - 1,127	1,219 - 1,709	65 - 173	--	0 - 180	10 - 83	109 - 370



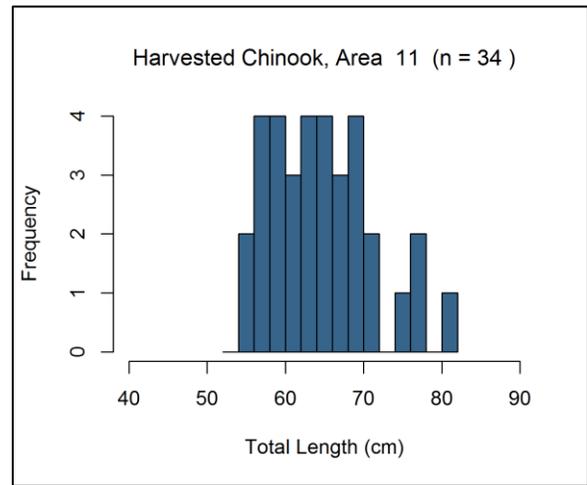
**Figure 6.1** Temporal patterns in fishing effort during the 2013-14 winter Chinook MSF in Marine Area 11.



**Figure 6.3** Temporal patterns in Chinook encounters (number retained and released) during the 2013-14 winter Chinook MSF in Marine Area 11.



**Figure 6.2** Temporal patterns in CPUE (number of Chinook landed per angler trip) during the 2013-14 winter Chinook MSF in Marine Area 11.



**Figure 6.4** Length-frequency distributions of retained marked Chinook sampled in dockside angler interviews during the 2013-14 winter Chinook MSF in Marine Area 11.

**Table 6.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2013-14 winter Chinook MSF in Marine Area 11.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	32	2	34
Unmarked	0	0	0
<b>Total</b>	<b>32</b>	<b>2</b>	<b>34</b>

**Table 6.4** Summary of CWTs recovered from Chinook salmon harvested during the 2013-14 winter Chinook MSF in Marine Area 11. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
WA	S Puget Sound (100%)	Minter Cr 15.0048	Minter Cr Hatchery	1 (100%)	0
<b>Total</b>				<b>1</b>	<b>0</b>

**Table 6.5** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs during the 2013-14 winter Chinook MSF in Marine Area 11, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	31 1-trip VTRs, 47 Angler Trips	22	7	11	1	41	0.80	0.76
Size/mark-status composition:		<b>0.54</b>	<b>0.17</b>	<b>0.27</b>	<b>0.02</b>			
Variance:		<b>(0.0062)</b>	<b>(0.0035)</b>	<b>(0.0049)</b>	<b>(0.0006)</b>			

**Table 6.6** Summary of season-wide fishery impact estimates for the 2013-14 winter Chinook MSF in Marine Area 11. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

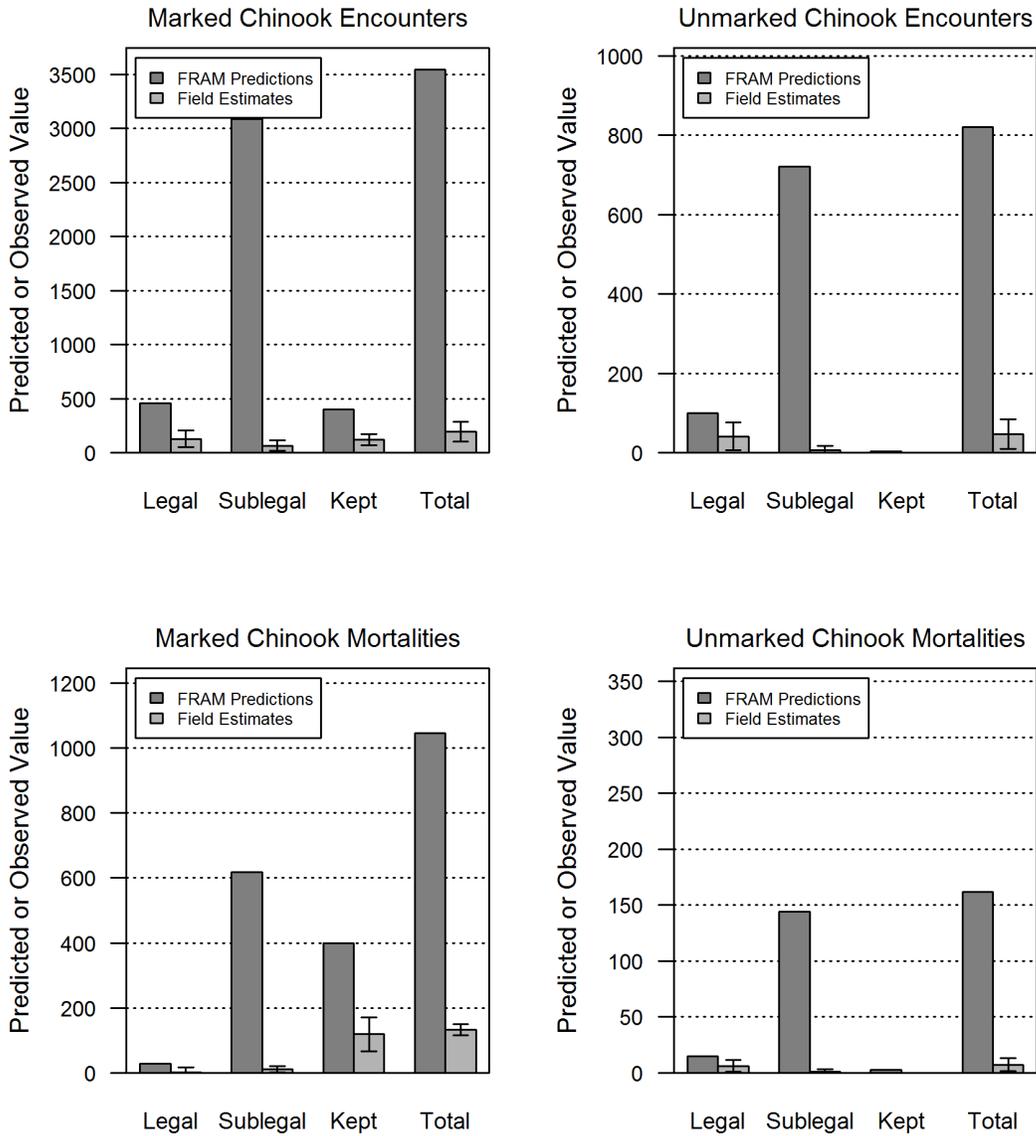
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	129	112	17	3	114	752	27	61 - 168	24
Legal UM	41	0	41	6	6	7	3	1 - 11	44
Sublegal AD	64	7	57	11	18	49	7	5 - 32	38
Sublegal UM	6	0	6	1	1	1	1	0 - 3	100
<b>Total</b>	<b>240</b>	<b>119</b>	<b>121</b>	<b>21</b>	<b>140</b>	<b>810</b>	<b>28</b>	<b>84 - 196</b>	<b>20</b>

**Table 6.7** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters for the 2013-14 winter Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	820	100	720	3
	AD	3,545	460	3,085	400
	Total	4,365	560	3,805	403
	% Marked	81	82	81	99
Estimated (Creel) Encounters	UM	47	41	6	0
	AD	193	129	64	119
	Total	240	169	70	119
	% Marked	80	76	92	100

**Table 6.8** Comparison of modeled (FRAM model run 1213) and estimated total Chinook mortalities for the 2013-14 winter Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	162	1,046	1,208	7	133	140
Released Legal	15	29	44	6	3	9
Released Sublegal	144	617	761	1	11	13
Landed Only	3	400	403	0	119	119



**Figure 6.5** Comparison of modeled (FRAM model run 1213) and estimated total Chinook encounters and mortalities for the 2013-14 winter Chinook MSF in Marine Area 11. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 6.9** Monthly sample rates (Total retained Chinook sampled / Estimated retained Chinook) in the 2013-14 winter Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
February	5 - 9	1 Feb - 2 Mar	20	0	20	8	0	8	39.6%
March	10 - 13	3 Mar - 30 Mar	19	0	19	7	0	7	37.5%
April	14 - 18	31 Mar - 30 Apr	80	0	80	19	0	19	23.8%
<b>Season Total</b>			<b>119</b>	<b>0</b>	<b>119</b>	<b>34</b>	<b>0</b>	<b>34</b>	<b>28.6%</b>

**Table 6.10** Fishery total estimates of retained and released salmon (*other than Chinook*) during the 2013-14 winter Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status. Values may not add exactly due to rounding error.

Month	Week	Start Date	End Date	Released Salmon		
				Coho UK	Cutthroat Trout	Unknown Salmonid
Feb	5	1-Feb	2-Feb	3	0	3
	6	3-Feb	9-Feb	0	0	3
	7	10-Feb	16-Feb	0	0	0
	8	17-Feb	23-Feb	0	0	0
	9	24-Feb	2-Mar	0	0	0
Mar	10	3-Mar	9-Mar	0	0	0
	11	10-Mar	16-Mar	0	0	0
	12	17-Mar	23-Mar	0	15	0
	13	24-Mar	30-Mar	0	0	0
	14	31-Mar	6-Apr	0	0	0
Apr	15	7-Apr	13-Apr	0	0	0
	16	14-Apr	20-Apr	0	0	0
	17	21-Apr	27-Apr	0	0	0
	18	28-Apr	30-Apr	0	0	0
<b>Area 11 Season Total:</b>				<b>3</b>	<b>15</b>	<b>6</b>
<b>Variance:</b>				1	83	6
<b>Standard Error:</b>				1	9	3
<b>CV (%):</b>				26	61	39
<b>95% CI:</b>				2 - 5	0 - 33	2 - 11

**Table 6.11** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2013-14 winter Chinook MSF in Marine Area 11. Bold sites indicate those included in the dockside sample frame.

Site Name	Total Anglers	Season Total (unadjusted) Size Measure
<b>Armeni Public Ramp</b>	<b>2</b>	<b>0.018</b>
Breakwater Marina	3	0.028
Commencement Bay Marina	17	0.156
Day Island Marina	1	0.009
Des Moines Marina	4	0.037
Dockton Ramp, Vashon Is	2	0.018
<b>Gig Harbor Ramp</b>	<b>12</b>	<b>0.110</b>
Harper Ramp	1	0.009
Manchester Public Ramp	7	0.064
Narrows Ramp	3	0.028
<b>Point Defiance Boathouse</b>	<b>15</b>	<b>0.138</b>
<b>Point Defiance Public Ramp</b>	<b>35</b>	<b>0.321</b>
Private	1	0.009
<b>Redondo Ramp</b>	<b>2</b>	<b>0.018</b>
Tacoma Outboard Association	2	0.018
Tyee Marina/Ramp	2	0.018
<b>Total Anglers</b>	<b>109</b>	<b>1.000</b>

**Table 6.12** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 11 Winter Chinook MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Feb 1 - Apr 30, 2010	3,096	315	3	11	0	47	80	114	10	580
Feb 1 - Apr 30, 2011	1,515	78	3	9	0	12	87	322	241	752
Feb 1 - Apr 30, 2012	1,937	170	0	4	0	25	142	630	182	1,153
Feb 1 - Apr 30, 2013	2,141	149	0	22	0	22	47	237	35	513
Feb 1 - Apr 30, 2014	1,464	112	0	7	0	17	41	57	6	240

## 7) Marine Area 12 Winter Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a fifth consecutive winter Chinook MSF in Marine Area 12 from October 1 – December 31, 2013 and February 1 – April 30, 2014. Data collection methods used to monitor the Area 12 Chinook MSF included dockside angler interviews (with catch sampling) and voluntary trip reports provided by private anglers. From these activities, we were able to estimate catch rates (CPUE), mark rates (based on VTRs), and landed-catch composition (age, length, and CWT). Additionally, we described relative catch and effort patterns throughout the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

WDFW dockside samplers conducted “Baseline Sampling” at selected access sites during the 2013-14 winter Chinook MSF in Area 12. Complete details of these methods are presented in a separate Methods Report (WDFW 2012a). Briefly, Baseline Sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sample effort. The Area 12 baseline sample frame included 12 different access sites (**Table 7.1**), and a total of 87 site visits during the six-month season. Site visits ranged from short (e.g., “no effort” samples) to full-day (8+ hours) sampling events. When present, samplers interviewed all anglers exiting the Area 12 fishery at the selected access site. The interview and catch-sampling procedures employed were identical to those used in other MSFs. Thus, Area 12 samplers acquired information about: 1) angling effort (boat and angler trips, trip length), 2) encounters composition (retained and/or released) by species and mark status (marked vs. unmarked, Chinook and Coho salmon only), and 3) landed Chinook size (fork and total length) and age (scales were collected and ultimately read) composition. Samplers also inspected landed Chinook and Coho salmon for CWTs using wand detectors and acquired snouts when tags were present; resulting tag data were used to estimate the CWT-based composition (unexpanded) of landed catch.

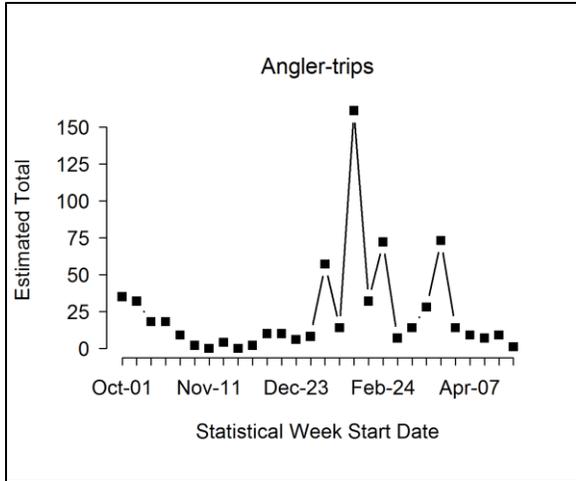
In contrast to the intensive “Murthy” survey design employed in other areas, Area 12 sampling results could not be used to produce fishery-total estimates of effort, encounters (retained catch + releases), and unmarked-DIT Chinook impacts. However, Area 12 baseline sampling observations will ultimately be combined with Catch Record Card (CRC) data, once they become available, to estimate catch and effort at the fishery-total level. Thus, while these descriptors of MSF impacts are not presented in this document, they will be available at a later date. In the following section we present results from our monitoring activities during the Area 12 winter 2013-14 Chinook MSF.

**Table 7.1** List of sites sampled with the number of sampling events (site-days) during the 2013-14 winter Chinook MSF in Marine Area 12.

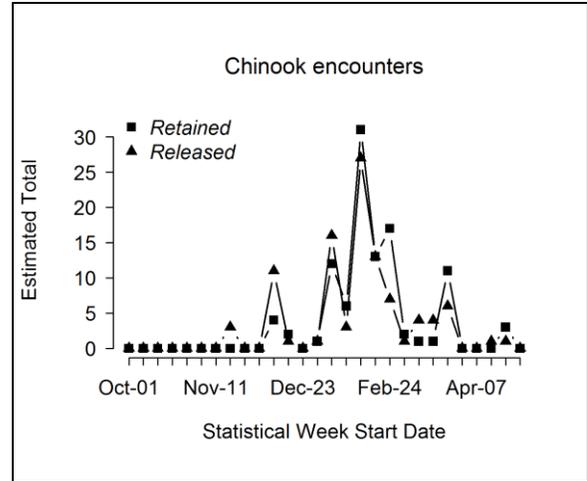
Location	Number of Site-Days Sampled per Month						Total Site-Days	% of Total
	October	November	December	February	March	April		
Skokomish Ramp	1	0	0	0	1	0	2	2.3%
Misery Point Ramp	7	4	7	7	13	8	46	52.9%
Pleasant Harbor Marina	0	0	0	0	2	0	2	2.3%
Pleasant Harbor Boat Ramp (WDFW)	0	0	3	9	1	0	13	14.9%
Salsbury County Park Ramp	0	0	0	0	2	4	6	6.9%
Tahuya Ramp	7	0	0	0	0	0	7	8.0%
Union Ramp	0	0	1	1	0	0	2	2.3%
Triton Cove State Park	0	0	1	1	0	0	2	2.3%
Hoodsport Shore	1	0	0	0	0	0	1	1.1%
Big Beef Beach	1	0	0	0	0	0	1	1.1%
Dewatto Creek Watch	4	0	0	0	0	0	4	4.6%
Skokomish Tide Flats	1	0	0	0	0	0	1	1.1%
<b>Grand Total</b>	<b>30</b>	<b>15</b>	<b>14</b>	<b>18</b>	<b>19</b>	<b>12</b>	<b>87</b>	<b>100.0%</b>

**Table 7.2** Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the 2013-14 winter Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status.

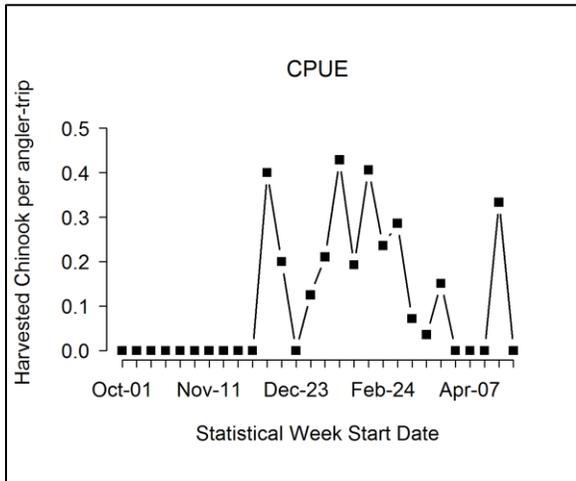
Stat Week	Start Date	End Date	Effort		Retained Fish			Released Fish						
			Boats	Anglers	Chinook AD	Coho UM	Chum	Chinook			Coho AD	Chum	Cutthroat Trout	Unknown Salmon
								AD	UM	UK				
40	1-Oct	6-Oct	26	35	0	0	0	0	0	0	0	0	0	0
41	7-Oct	13-Oct	19	32	0	0	0	0	0	0	0	0	0	1
42	14-Oct	20-Oct	11	18	0	12	0	0	0	0	0	0	0	0
43	21-Oct	27-Oct	11	18	0	10	2	0	0	0	0	15	0	0
44	28-Oct	3-Nov	6	9	0	0	0	0	0	0	1	0	0	0
45	4-Nov	10-Nov	2	2	0	0	0	0	0	0	0	0	0	0
46	11-Nov	17-Nov	0	0	0	0	0	0	0	0	0	0	0	0
47	18-Nov	24-Nov	2	4	0	0	0	2	0	1	0	0	0	0
48	25-Nov	1-Dec	0	0	0	0	0	0	0	0	0	0	0	0
49	2-Dec	8-Dec	1	2	0	0	0	0	0	0	0	0	0	0
50	9-Dec	15-Dec	5	10	4	0	0	7	2	2	0	0	0	0
51	16-Dec	22-Dec	5	10	2	0	0	0	0	1	0	0	0	0
52	23-Dec	29-Dec	3	6	0	0	0	0	0	0	0	0	0	0
53	30-Dec	31-Dec	5	8	1	0	0	1	0	0	0	0	0	0
05	1-Feb	2-Feb	25	57	12	0	0	3	5	8	0	0	0	0
06	3-Feb	9-Feb	6	14	6	0	0	1	0	2	0	0	0	0
07	10-Feb	16-Feb	66	161	31	0	0	23	2	2	0	0	0	0
08	17-Feb	23-Feb	17	32	13	0	0	11	0	2	0	0	0	0
09	24-Feb	2-Mar	32	72	17	0	0	2	2	3	0	0	0	0
10	3-Mar	9-Mar	4	7	2	0	0	1	0	0	0	0	0	0
11	10-Mar	16-Mar	8	14	1	0	0	4	0	0	0	0	0	0
12	17-Mar	23-Mar	17	28	1	0	0	3	1	0	0	0	0	0
13	24-Mar	30-Mar	29	73	11	0	0	2	1	3	0	0	0	0
14	31-Mar	6-Apr	9	14	0	0	0	0	0	0	0	0	7	0
15	7-Apr	13-Apr	5	9	0	0	0	0	0	0	0	0	0	0
16	14-Apr	20-Apr	4	7	0	0	0	1	0	0	0	0	0	0
17	21-Apr	27-Apr	5	9	3	0	0	1	0	0	0	0	2	0
18	28-Apr	30-Apr	1	1	0	0	0	0	0	0	0	0	2	0
<b>Season Total:</b>			<b>324</b>	<b>652</b>	<b>104</b>	<b>22</b>	<b>2</b>	<b>62</b>	<b>13</b>	<b>24</b>	<b>1</b>	<b>15</b>	<b>11</b>	<b>1</b>



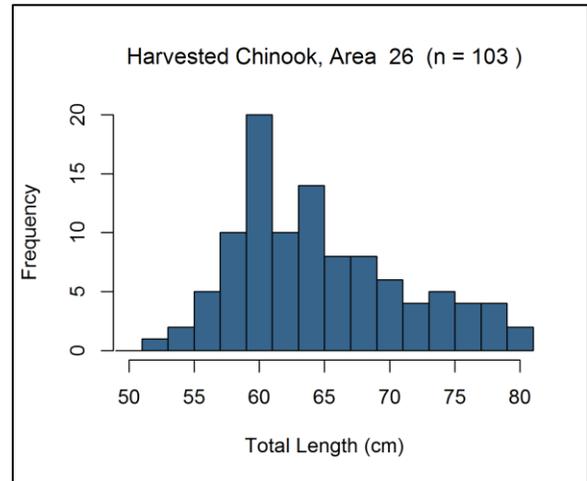
**Figure 7.1** Temporal patterns in fishing effort during the 2013-14 winter Chinook MSF in Marine Area. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 7.3** Temporal patterns in Chinook encounters (number retained and released) during the 2013-14 winter Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 7.2** Temporal patterns in CPUE (number of Chinook landed per angler trip) during the 2013-14 winter Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 7.4** Length-frequency distributions of retained marked Chinook sampled in dockside angler interviews during the 2013-14 winter Chinook MSF in Marine Area 12.

**Table 7.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2013-14 winter Chinook MSF in Marine Area 12.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	99	4	103
Unmarked	1	0	1
<b>Total</b>	<b>100</b>	<b>4</b>	<b>104</b>

**Table 7.4** Summary of CWTs recovered from Chinook salmon harvested during the 2013-14 winter Chinook MSF in Marine Area 12. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
B.C. (12.5%)	Georgia Strait (12.5%)	Big Qualicum R	Big Qualicum H	1 (12.5%)	0
WA (87.5%)	Hood Canal (62.5%)	Finch Cr 16.0222	Hoodsport H	5 (62.5%)	0
	N Puget Sound (12.5%)	Whitehorse Springs	Stillaguamish H	1 (12.5%)	0
	S Puget Sound (12.5%)	Minter Cr 15.0048	Minter Cr H	1 (12.5%)	0
<b>Total</b>				<b>8</b>	<b>0</b>

**Table 7.5** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs during the 2013-14 winter Chinook MSF in Marine Area 12, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	14 1-trip VTRs, 30 Angler Trips	26	0	10	4	40	0.90	1.00
Size/mark-status composition:		0.65	0.00	0.25	0.10			
Variance:		(0.0058)	(0.0000)	(0.0048)	(0.0023)			

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## APPENDICES

**Appendix A.1** Size measures by sample date, for sites sampled during dockside creel surveys for the 2013-14 winter Chinook MSF in Marine Area 8-1.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
11/1/2013	44	Camano Island State Park Public Ramp	0.2661	Oak Harbor Marina & Public Ramp	0.2775
11/2/2013	44	Camano Island State Park Public Ramp	0.2661	Oak Harbor Marina & Public Ramp	0.2775
11/4/2013	45	Camano Island State Park Public Ramp	0.2661	Coupeville Public Ramp	0.0786
11/8/2013	45	Camano Island State Park Public Ramp	0.2661	Norton Street (Everett) Ramp	0.0765
11/9/2013	45	Camano Island State Park Public Ramp	0.2661	Coupeville Public Ramp	0.0786
11/12/2013	46	Camano Island State Park Public Ramp	0.2661	Coupeville Public Ramp	0.0786
11/16/2013	46	Camano Island State Park Public Ramp	0.2661	Norton Street (Everett) Ramp	0.0765
11/17/2013	46	Camano Island State Park Public Ramp	0.2661	Norton Street (Everett) Ramp	0.0765
11/20/2013	47	Camano Island State Park Public Ramp	0.2661	Oak Harbor Marina & Public Ramp	0.2775
11/22/2013	47	Camano Island State Park Public Ramp	0.2661	Coupeville Public Ramp	0.0786
11/24/2013	47	Camano Island State Park Public Ramp	0.2661	Oak Harbor Marina & Public Ramp	0.2775
11/25/2013	48	Camano Island State Park Public Ramp	0.2661	Oak Harbor Marina & Public Ramp	0.2775
11/30/2013	48	Camano Island State Park Public Ramp	0.2661	Norton Street (Everett) Ramp	0.0765
12/1/2013	48	Camano Island State Park Public Ramp	0.1511	Coupeville Public Ramp	0.1007
12/4/2013	49	Camano Island State Park Public Ramp	0.1511	Norton Street (Everett) Ramp	0.2443
12/6/2013	49	Camano Island State Park Public Ramp	0.1511	Oak Harbor Marina & Public Ramp	0.2713
12/8/2013	49	Camano Island State Park Public Ramp	0.1511	Norton Street (Everett) Ramp	0.2443
12/10/2013	50	Camano Island State Park Public Ramp	0.1511	Oak Harbor Marina & Public Ramp	0.2713
12/14/2013	50	Camano Island State Park Public Ramp	0.1511	Oak Harbor Marina & Public Ramp	0.2713
12/15/2013	50	Camano Island State Park Public Ramp	0.1511	Oak Harbor Marina & Public Ramp	0.2713
12/19/2013	51	Camano Island State Park Public Ramp	0.1511	Oak Harbor Marina & Public Ramp	0.2713
12/21/2013	51	Camano Island State Park Public Ramp	0.1511	Norton Street (Everett) Ramp	0.2443
12/22/2013	51	Camano Island State Park Public Ramp	0.1511	Coupeville Public Ramp	0.1007
12/23/2013	52	Camano Island State Park Public Ramp	0.1511	Norton Street (Everett) Ramp	0.2443
12/28/2013	52	Camano Island State Park Public Ramp	0.1511	Maple Grove Ramp; Camano Is	0.1811
12/29/2013	52	Camano Island State Park Public Ramp	0.1511	Maple Grove Ramp; Camano Is	0.1811
1/2/2014	1	Camano Island State Park Public Ramp	0.4682	Norton Street (Everett) Ramp	0.1168
1/4/2014	1	Camano Island State Park Public Ramp	0.4682	Coupeville Public Ramp	0.0557
1/5/2014	1	Camano Island State Park Public Ramp	0.4682	Oak Harbor Marina & Public Ramp	0.1294
1/7/2014	2	Camano Island State Park Public Ramp	0.4682	Oak Harbor Marina & Public Ramp	0.1294
1/10/2014	2	Camano Island State Park Public Ramp	0.4682	Norton Street (Everett) Ramp	0.1168
1/12/2014	2	Camano Island State Park Public Ramp	0.4682	Oak Harbor Marina & Public Ramp	0.1294
1/16/2014	3	Camano Island State Park Public Ramp	0.4682	Norton Street (Everett) Ramp	0.1168

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
1/17/2014	3	Camano Island State Park Public Ramp	0.4682	Oak Harbor Marina & Public Ramp	0.1294
1/18/2014	3	Camano Island State Park Public Ramp	0.4682	Norton Street (Everett) Ramp	0.1168
1/22/2014	4	Camano Island State Park Public Ramp	0.4682	Oak Harbor Marina & Public Ramp	0.1294
1/24/2014	4	Camano Island State Park Public Ramp	0.4682	Oak Harbor Marina & Public Ramp	0.1294
1/25/2014	4	Camano Island State Park Public Ramp	0.4682	Oak Harbor Marina & Public Ramp	0.1294
1/28/2014	5	Camano Island State Park Public Ramp	0.4682	Coupeville Public Ramp	0.0557
1/31/2014	5	Camano Island State Park Public Ramp	0.4682	Coupeville Public Ramp	0.0557
2/1/2014	5	Camano Island State Park Public Ramp	0.4442	Norton Street (Everett) Ramp	0.0791
2/3/2014	6	Camano Island State Park Public Ramp	0.4442	Coupeville Public Ramp	0.0434
2/7/2014	6	Camano Island State Park Public Ramp	0.4442	Oak Harbor Marina & Public Ramp	0.1362
2/9/2014	6	Camano Island State Park Public Ramp	0.4442	Oak Harbor Marina & Public Ramp	0.1362
2/13/2014	7	Camano Island State Park Public Ramp	0.4442	Norton Street (Everett) Ramp	0.0791
2/14/2014	7	Camano Island State Park Public Ramp	0.4442	Norton Street (Everett) Ramp	0.0791
2/15/2014	7	Camano Island State Park Public Ramp	0.4442	Oak Harbor Marina & Public Ramp	0.1362
2/20/2014	8	Camano Island State Park Public Ramp	0.4442	Oak Harbor Marina & Public Ramp	0.1362
2/21/2014	8	Camano Island State Park Public Ramp	0.4442	Oak Harbor Marina & Public Ramp	0.1362
2/22/2014	8	Camano Island State Park Public Ramp	0.4442	Oak Harbor Marina & Public Ramp	0.1362
2/24/2014	9	Camano Island State Park Public Ramp	0.4442	Norton Street (Everett) Ramp	0.0791
2/28/2014	9	Camano Island State Park Public Ramp	0.4442	Oak Harbor Marina & Public Ramp	0.1362
3/2/2014	9	Camano Island State Park Public Ramp	0.4824	Oak Harbor Marina & Public Ramp	0.0647
3/4/2014	10	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
3/7/2014	10	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
3/8/2014	10	Camano Island State Park Public Ramp	0.4824	Oak Harbor Marina & Public Ramp	0.0647
3/13/2014	11	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
3/15/2014	11	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
3/16/2014	11	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
3/18/2014	12	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
3/21/2014	12	Camano Island State Park Public Ramp	0.4824	Oak Harbor Marina & Public Ramp	0.0647
3/22/2014	12	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
3/26/2014	13	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
3/29/2014	13	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
3/30/2014	13	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
3/31/2014	14	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
4/4/2014	14	Camano Island State Park Public Ramp	0.4824	Oak Harbor Marina & Public Ramp	0.0647
4/5/2014	14	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
4/9/2014	15	Camano Island State Park Public Ramp	0.4824	Oak Harbor Marina & Public Ramp	0.0647
4/12/2014	15	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
4/13/2014	15	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
4/16/2014	16	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
4/18/2014	16	Camano Island State Park Public Ramp	0.4824	Oak Harbor Marina & Public Ramp	0.0647
4/20/2014	16	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
4/24/2014	17	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000
4/26/2014	17	Camano Island State Park Public Ramp	0.4824	Norton Street (Everett) Ramp	0.1690
4/27/2014	17	Camano Island State Park Public Ramp	0.4824	Oak Harbor Marina & Public Ramp	0.0647
4/29/2014	18	Camano Island State Park Public Ramp	0.4824	Maple Grove Ramp; Camano Is	0.2000

**Appendix A.2** Size measures by sample date, for sites sampled during dockside creel surveys for the 2013-14 winter Chinook MSF in Marine Area 8-2.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
11/1/2013	44	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/2/2013	44	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/4/2013	45	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/8/2013	45	Dagmar's Landing; Forklift Launch	0.0805	Norton Street (Everett) Ramp	0.5660
11/9/2013	45	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/12/2013	46	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/16/2013	46	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/17/2013	46	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/20/2013	47	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/22/2013	47	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/24/2013	47	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/25/2013	48	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
11/30/2013	48	Camano Island State Park Public Ramp	0.3107	Norton Street (Everett) Ramp	0.5660
12/1/2013	48	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
12/4/2013	49	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
12/6/2013	49	Dagmar's Landing; Forklift Launch	0.1026	Norton Street (Everett) Ramp	0.6851
12/8/2013	49	Norton Street (Everett) Ramp	0.6851	Bayside Marine	0.0668
12/10/2013	50	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
12/14/2013	50	Norton Street (Everett) Ramp	0.6851	Bayside Marine	0.0668
12/15/2013	50	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
12/19/2013	51	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
12/21/2013	51	Dagmar's Landing; Forklift Launch	0.1026	Norton Street (Everett) Ramp	0.6851
12/22/2013	51	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
12/23/2013	52	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
12/28/2013	52	Dagmar's Landing; Forklift Launch	0.1026	Norton Street (Everett) Ramp	0.6851

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
12/29/2013	52	Camano Island State Park Public Ramp	0.1080	Norton Street (Everett) Ramp	0.6851
1/2/2014	1	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/4/2014	1	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/5/2014	1	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/7/2014	2	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/10/2014	2	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/12/2014	2	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/16/2014	3	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/17/2014	3	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/18/2014	3	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/22/2014	4	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/24/2014	4	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/25/2014	4	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/28/2014	5	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
1/31/2014	5	Camano Island State Park Public Ramp	0.2144	Norton Street (Everett) Ramp	0.6134
2/1/2014	5	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/3/2014	6	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/7/2014	6	Dagmar's Landing; Forklift Launch	0.0466	Norton Street (Everett) Ramp	0.6963
2/9/2014	6	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/13/2014	7	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/14/2014	7	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/15/2014	7	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/20/2014	8	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/21/2014	8	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/22/2014	8	Dagmar's Landing; Forklift Launch	0.0466	Norton Street (Everett) Ramp	0.6963
2/24/2014	9	Camano Island State Park Public Ramp	0.1543	Norton Street (Everett) Ramp	0.6963
2/28/2014	9	Dagmar's Landing; Forklift Launch	0.0466	Norton Street (Everett) Ramp	0.6963
3/2/2014	9	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/4/2014	10	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/7/2014	10	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/8/2014	10	Dagmar's Landing; Forklift Launch	0.0523	Norton Street (Everett) Ramp	0.5866
3/13/2014	11	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/15/2014	11	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/16/2014	11	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/18/2014	12	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/21/2014	12	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/22/2014	12	Dagmar's Landing; Forklift Launch	0.0523	Norton Street (Everett) Ramp	0.5866

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
3/26/2014	13	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/29/2014	13	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
3/30/2014	13	Dagmar's Landing; Forklift Launch	0.0523	Norton Street (Everett) Ramp	0.5866
3/31/2014	14	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/4/2014	14	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/5/2014	14	Dagmar's Landing; Forklift Launch	0.0523	Norton Street (Everett) Ramp	0.5866
4/9/2014	15	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/12/2014	15	Dagmar's Landing; Forklift Launch	0.0523	Norton Street (Everett) Ramp	0.5866
4/13/2014	15	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/16/2014	16	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/18/2014	16	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/20/2014	16	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/24/2014	17	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/26/2014	17	Dagmar's Landing; Forklift Launch	0.0523	Norton Street (Everett) Ramp	0.5866
4/27/2014	17	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866
4/29/2014	18	Camano Island State Park Public Ramp	0.1937	Norton Street (Everett) Ramp	0.5866

**Appendix A.3** Size measures by sample date, for sites sampled during dockside creel surveys for the 2013-14 winter Chinook MSF in Marine Area 10.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
10/1/2013	40	Armeni Public Ramp	0.2711	Kingston Public Ramp	0.0910
10/4/2013	40	Shilshole Public Ramp	0.4700	Edmonds Boat Loft (Priv. fork lift)	0.1270
10/6/2013	40	Armeni Public Ramp	0.2711	Shilshole Public Ramp	0.4700
10/9/2013	41	Armeni Public Ramp	0.2711	Shilshole Public Ramp	0.4700
10/11/2013	41	Armeni Public Ramp	0.2711	Shilshole Public Ramp	0.4700
10/13/2013	41	Armeni Public Ramp	0.2711	Kingston Public Ramp	0.0910
10/17/2013	42	Shilshole Public Ramp	0.4700	Kingston Public Ramp	0.0910
10/19/2013	42	Armeni Public Ramp	0.2711	Shilshole Public Ramp	0.4700
10/20/2013	42	Armeni Public Ramp	0.2711	Shilshole Public Ramp	0.4700
10/24/2013	43	Shilshole Public Ramp	0.4700	Edmonds Boat Loft (Priv. fork lift)	0.1270
10/25/2013	43	Armeni Public Ramp	0.2711	Shilshole Public Ramp	0.4700
10/27/2013	43	Armeni Public Ramp	0.6537	Shilshole Public Ramp	0.0267
10/29/2013	44	Armeni Public Ramp	0.2711	Shilshole Public Ramp	0.4700
11/1/2013	44	Armeni Public Ramp	0.1449	Kingston Public Ramp	0.1304
11/2/2013	44	Armeni Public Ramp	0.1449	Shilshole Public Ramp	0.5797
11/4/2013	45	Armeni Public Ramp	0.1449	Shilshole Public Ramp	0.5797

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
11/8/2013	45	Armeni Public Ramp	0.1449	Shilshole Public Ramp	0.5797
11/9/2013	45	Shilshole Public Ramp	0.5797	Kingston Public Ramp	0.1304
11/12/2013	46	Armeni Public Ramp	0.1449	Shilshole Public Ramp	0.5797
11/16/2013	46	Armeni Public Ramp	0.1449	Shilshole Public Ramp	0.5797
11/17/2013	46	Armeni Public Ramp	0.7924	Edmonds Boat Loft (Priv. fork lift)	0.0617
11/20/2013	47	Manchester Public Ramp	0.1159	Shilshole Public Ramp	0.5797
11/22/2013	47	Armeni Public Ramp	0.1449	Shilshole Public Ramp	0.5797
11/24/2013	47	Armeni Public Ramp	0.7924	Shilshole Public Ramp	0.0961
11/25/2013	48	Shilshole Public Ramp	0.5797	Kingston Public Ramp	0.1304
11/30/2013	48	Armeni Public Ramp	0.1449	Shilshole Public Ramp	0.5797
12/1/2013	48	Armeni Public Ramp	0.7087	Shilshole Public Ramp	0.1069
12/4/2013	49	Armeni Public Ramp	0.1363	Kingston Public Ramp	0.2391
12/6/2013	49	Shilshole Public Ramp	0.3452	Edmonds Boat Loft (Priv. fork lift)	0.1844
12/8/2013	49	Armeni Public Ramp	0.7087	Shilshole Public Ramp	0.1069
12/10/2013	50	Armeni Public Ramp	0.1363	Manchester Public Ramp	0.0950
12/14/2013	50	Armeni Public Ramp	0.1363	Shilshole Public Ramp	0.3452
12/15/2013	50	Armeni Public Ramp	0.7087	Shilshole Public Ramp	0.1069
12/19/2013	51	Shilshole Public Ramp	0.3452	Kingston Public Ramp	0.2391
12/21/2013	51	Shilshole Public Ramp	0.3452	Kingston Public Ramp	0.2391
12/22/2013	51	Shilshole Public Ramp	0.1069	Edmonds Boat Loft (Priv. fork lift)	0.0617
12/23/2013	52	Armeni Public Ramp	0.1363	Edmonds Boat Loft (Priv. fork lift)	0.1844
12/28/2013	52	Shilshole Public Ramp	0.3452	Edmonds Boat Loft (Priv. fork lift)	0.1844
12/29/2013	52	Armeni Public Ramp	0.7087	Shilshole Public Ramp	0.1069
1/2/2014	1	Armeni Public Ramp	0.1408	Shilshole Public Ramp	0.2778
1/4/2014	1	Shilshole Public Ramp	0.2778	Edmonds Boat Loft (Priv. fork lift)	0.0961
1/5/2014	1	Armeni Public Ramp	0.1408	Shilshole Public Ramp	0.2778
1/7/2014	2	Shilshole Public Ramp	0.2778	Edmonds Boat Loft (Priv. fork lift)	0.0961
1/10/2014	2	Armeni Public Ramp	0.1408	Kingston Public Ramp	0.2538
1/12/2014	2	Manchester Public Ramp	0.2315	Shilshole Public Ramp	0.2778
1/16/2014	3	Armeni Public Ramp	0.1408	Edmonds Boat Loft (Priv. fork lift)	0.0961
1/17/2014	3	Shilshole Public Ramp	0.2778	Kingston Public Ramp	0.2538
1/18/2014	3	Armeni Public Ramp	0.1408	Edmonds Boat Loft (Priv. fork lift)	0.0961
1/22/2014	4	Shilshole Public Ramp	0.2778	Edmonds Boat Loft (Priv. fork lift)	0.0961
1/24/2014	4	Armeni Public Ramp	0.1408	Edmonds Boat Loft (Priv. fork lift)	0.0961
1/25/2014	4	Shilshole Public Ramp	0.2778	Kingston Public Ramp	0.2538
1/28/2014	5	Shilshole Public Ramp	0.2778	Kingston Public Ramp	0.2538
1/31/2014	5	Armeni Public Ramp	0.1408	Shilshole Public Ramp	0.2778

**Appendix A.4** Size measures by sample date, for sites sampled during dockside creel surveys for the 2013-14 winter Chinook MSF in Marine Area 11.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
2/1/2014	5	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/3/2014	6	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/7/2014	6	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/9/2014	6	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/13/2014	7	Gig Harbor Ramp	0.1422	Point Defiance Public Ramp	0.5351
2/14/2014	7	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/15/2014	7	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/20/2014	8	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/21/2014	8	Gig Harbor Ramp	0.1422	Point Defiance Public Ramp	0.5351
2/22/2014	8	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/24/2014	9	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
2/28/2014	9	Point Defiance Boathouse	0.2605	Point Defiance Public Ramp	0.5351
3/2/2014	9	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/4/2014	10	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/7/2014	10	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/8/2014	10	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/13/2014	11	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/15/2014	11	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/16/2014	11	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/18/2014	12	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/21/2014	12	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/22/2014	12	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/26/2014	13	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/29/2014	13	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/30/2014	13	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
3/31/2014	14	Point Defiance Boathouse	0.3484	Point Defiance Public Ramp	0.5634
4/4/2014	14	Point Defiance Boathouse	0.2626	Point Defiance Public Ramp	0.5174
4/5/2014	14	Gig Harbor Ramp	0.1632	Point Defiance Public Ramp	0.5174
4/9/2014	15	Armeni Public Ramp	0.0413	Point Defiance Public Ramp	0.5174
4/12/2014	15	Gig Harbor Ramp	0.1632	Point Defiance Public Ramp	0.5174
4/13/2014	15	Point Defiance Boathouse	0.2626	Point Defiance Public Ramp	0.5174
4/16/2014	16	Gig Harbor Ramp	0.1632	Point Defiance Public Ramp	0.5174
4/18/2014	16	Point Defiance Boathouse	0.2626	Point Defiance Public Ramp	0.5174
4/20/2014	16	Gig Harbor Ramp	0.1632	Point Defiance Public Ramp	0.5174
4/24/2014	17	Point Defiance Boathouse	0.2626	Point Defiance Public Ramp	0.5174

*Draft; December 19, 2014*

<b>Sample Date</b>	<b>Week</b>	<b>Location #1</b>	<b>Site Size</b>	<b>Location #2</b>	<b>Site Size</b>
4/26/2014	17	Gig Harbor Ramp	0.1632	Point Defiance Public Ramp	0.5174
4/27/2014	17	Gig Harbor Ramp	0.1632	Point Defiance Public Ramp	0.5174
4/29/2014	18	Point Defiance Boathouse	0.2626	Point Defiance Public Ramp	0.5174

## Appendix B.1 Coded-wire tag (CWT) recoveries from the 2013-14 winter Chinook MSF in Marine Area 6.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
6	4-Dec-13	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		53	87087	AD
6	8-Dec-13	635697	2010	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	635698	60	87088	AD
6	9-Dec-13	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	63	87089	AD
6	19-Dec-13	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		58	87090	AD
6	27-Dec-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		63	87091	AD
6	29-Dec-13	635693	2010	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	635696	56	71901	AD
6	29-Dec-13	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	67	71902	AD
6	3-Jan-14	211016	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		60	77651	AD
6	4-Jan-14	180279	2011	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	182068,182467,181982,182385	55	71903	AD
6	4-Jan-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		57	71904	AD
6	4-Jan-14	210957	2010	CLEAR CR 11.0013C	CLEAR CREEK H	NISQ	635692	63	77656	AD
6	12-Jan-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	71905	AD
6	14-Jan-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		52	65886	AD
6	14-Jan-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		55	65887	AD
6	14-Jan-14	635683	2010	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	635682	69	65922	AD
6	14-Jan-14	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		52	65923	AD
6	15-Jan-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		54	77509	AD
6	16-Jan-14	90265	2009	SANTIAM R S FK	SOUTH SANTIAM HATCH	ODFW		61	74572	AD
6	16-Jan-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		67	77657	AD
6	17-Jan-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		52	71906	AD
6	18-Jan-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	63	71907	AD
6	22-Jan-14	635283	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		70	71908	AD
6	22-Jan-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		59	71909	AD
6	22-Jan-14	210973	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		61	71910	AD
6	23-Jan-14	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		59	65891	AD
6	23-Jan-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		53	65892	AD
6	24-Jan-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		53	71912	AD
6	24-Jan-14	635683	2010	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	635682	59	71913	AD
6	25-Jan-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	61	71914	AD
6	25-Jan-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		57	71915	AD
6	25-Jan-14	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		58	71916	AD
6	31-Jan-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		53	65893	AD
6	31-Jan-14	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		59	65894	AD
6	31-Jan-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		52	65895	AD
6	31-Jan-14	181892	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		58	65897	AD
6	9-Feb-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		69	71917	AD
6	9-Feb-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	60	71918	AD
6	15-Feb-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		67	62266	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
6	15-Feb-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66	62267	AD
6	15-Feb-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	61	65888	AD
6	15-Feb-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		68	65889	AD
6	15-Feb-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	62	65898	AD
6	15-Feb-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		73	71919	AD
6	15-Feb-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		57	71921	AD
6	15-Feb-14	90492	2010	UMATILLA R	BONNEVILLE H	ODFW	090493,090491,090489,090490	62	71922	AD
6	15-Feb-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		62	77661	AD
6	15-Feb-14	210973	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		70	87412	AD
6	16-Feb-14	636434	2011	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		55	71924	AD
6	16-Feb-14	636434	2011	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		61	77654	AD
6	16-Feb-14	635598	2010	WENATCHEE R 45.0030	DRYDEN POND	WDFW		58	77660	AD
6	16-Feb-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		62	77662	AD
6	16-Feb-14	210972	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		67	77663	AD
6	16-Feb-14	635283	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		67	77664	AD
6	22-Feb-14	210973	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		55	71925	AD
6	2-Mar-14	182068	2011	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	182467,181982,180279,182385	57	71926	AD
6	2-Mar-14	635282	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	635679	73	71927	AD
6	3-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	61	71928	AD
6	3-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	70	71929	AD
6	4-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	62	71930	AD
6	4-Mar-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		59	71931	AD
6	7-Mar-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		67	77655	AD
6	13-Mar-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		64	71932	AD
6	13-Mar-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		61	71933	AD
6	13-Mar-14	636098	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		51	77508	AD
6	15-Mar-14	210976	2010	WHITE R 10.0031	WHITE RIVER H	MUCK		65	71923	UM
6	15-Mar-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		61	77551	AD
6	16-Mar-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		59	77552	AD
6	16-Mar-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		58	77658	AD
6	18-Mar-14	211015	2011	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		55	77553	AD
6	21-Mar-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		61	77505	AD
6	21-Mar-14	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		58	77554	AD
6	21-Mar-14	635282	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	635679	76	77555	AD
6	21-Mar-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		57	77556	AD
6	21-Mar-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		61	77557	AD
6	21-Mar-14	90582	2011	BIG CR (LWR COL R)	BIG CR HATCHERY	ODFW	090583,090567,090566	63	77558	AD
6	21-Mar-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		56	77559	AD
6	22-Mar-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		68	77561	AD
6	22-Mar-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		56	77562	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
6	22-Mar-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		60	77665	AD
6	23-Mar-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		55	77666	AD
6	23-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	58	77949	AD
6	24-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	66	77564	AD
6	26-Mar-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		67	77565	AD
6	27-Mar-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		64	77901	AD
6	29-Mar-14	181889	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		60	77567	AD
6	29-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	65	77568	AD
6	31-Mar-14	210973	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		73	77569	AD
6	31-Mar-14	210963	2010	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	635695	66	77570	AD
6	31-Mar-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		55	77571	AD
6	31-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	67	77572	AD
6	31-Mar-14	635697	2010	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	635698	61	77573	AD
6	1-Apr-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		66	77574	AD
6	3-Apr-14	55405	2010	SPRING CR 29.0159	SPRING CR NFH	FWS	055406	74	77503	AD
6	3-Apr-14	210957	2010	CLEAR CR 11.0013C	CLEAR CREEK H	NISQ	635692	65	77947	AD
6	4-Apr-14	210957	2010	CLEAR CR 11.0013C	CLEAR CREEK H	NISQ	635692	61	77575	AD
6	4-Apr-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		73	77667	AD
6	4-Apr-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		59	77950	AD
6	5-Apr-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		54	77576	AD
6	5-Apr-14	181891	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		55	77668	AD
6	6-Apr-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		56	77902	AD
6	6-Apr-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		72	77903	AD
6	6-Apr-14	90536	2010	MCKENZIE R 1	MCKENZIE HATCHERY	ODFW		72	77904	AD
6	6-Apr-14	181975	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		53	77946	AD
6	7-Apr-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		55	77578	AD

Appendix B.2 Coded-wire tag (CWT) recoveries from the 2013-14 winter Chinook MSF in Marine Area 7.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
7	4-Dec-13	181567	2011	R-BIG QUALICUM R	H-BIG QUALICUM RIVER H	CDFO		61	74201	AD
7	6-Dec-13	635587	2010	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		63	74419	AD
7	6-Dec-13	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	64	74420	AD
7	6-Dec-13	210950	2010	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA	210977	61	74422	AD
7	6-Dec-13	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	59	74423	AD
7	6-Dec-13	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		76	74424	AD
7	6-Dec-13	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		54	74425	AD
7	6-Dec-13	635683	2010	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	635682	72	74426	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
7	6-Dec-13	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		70	74427	AD
7	6-Dec-13	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	63	74428	AD
7	6-Dec-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		67	74429	AD
7	6-Dec-13	181974	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		56	74430	AD
7	6-Dec-13	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		70	74432	AD
7	6-Dec-13	635369	2009	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		74	74433	AD
7	6-Dec-13	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		62	74434	AD
7	6-Dec-13	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		57	74435	AD
7	7-Dec-13	635573	2009	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	635574	71	74204	AD
7	7-Dec-13	635369	2009	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		80	74436	AD
7	7-Dec-13	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	74437	AD
7	7-Dec-13	635697	2010	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	635698	70	74438	AD
7	7-Dec-13	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	74439	AD
7	7-Dec-13	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		54	74440	AD
7	7-Dec-13	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		59	74441	AD
7	7-Dec-13	181584	2010	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	181679,181592,181588,181590	67	74442	AD
7	7-Dec-13	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	74443	AD
7	7-Dec-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		64	74444	AD
7	7-Dec-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		70	74445	AD
7	10-Dec-13	635573	2009	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	635574	73	74205	AD
7	14-Dec-13	181473	2010	R-HARRISON R	H-CHEHALIS RIVER H	CDFO		73	74202	AD
7	15-Dec-13	210963	2010	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	635695	76	43258	AD
7	19-Dec-13	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	57	77653	AD
7	22-Dec-13	635693	2010	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	635696	62	62259	AD
7	28-Dec-13	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	60	74203	AD
7	28-Dec-13	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	68	74302	AD
7	28-Dec-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		80	74303	AD
7	28-Dec-13	636277	2011	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		52	74304	AD
7	29-Dec-13	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		63	43259	AD
7	29-Dec-13	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	66	62258	AD
7	29-Dec-13	210950	2010	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA	210977	68	74305	AD
7	3-Jan-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		54	28898	AD
7	3-Jan-14	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		64	32990	AD
7	3-Jan-14	210963	2010	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	635695	58	32991	AD
7	3-Jan-14	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		62	32992	AD
7	4-Jan-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		61	32616	AD
7	4-Jan-14	635697	2010	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	635698	60	74206	AD
7	4-Jan-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	74208	AD
7	4-Jan-14	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		76	74209	AD
7	4-Jan-14	210964	2010	CO LINE PD2 03.1853B	MARBLEMOUNT H	WDFW		58	74210	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
7	5-Jan-14	181192	2011	R-BIG QUALICUM R	H-BIG QUALICUM RIVER H	CDFO		62	74306	AD
7	5-Jan-14	210963	2010	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	635695	64	74307	AD
7	16-Jan-14	51267	2010	ENTIAT R 46.0042	ENTIAT NFH	FWS		53	62262	AD
7	16-Jan-14	210963	2010	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	635695	53	74211	AD
7	17-Jan-14	210972	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		64	62260	AD
7	22-Jan-14	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		57	74212	AD
7	24-Jan-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		57	32993	AD
7	25-Jan-14	636434	2011	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		53	62261	AD
7	26-Jan-14	181980	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		64	32989	AD
7	26-Jan-14	636434	2011	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		56	32994	AD
7	1-Feb-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		68	74213	AD
7	1-Feb-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		67	74214	AD
7	1-Feb-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		55	74215	AD
7	1-Feb-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		75	74216	AD
7	7-Feb-14	635369	2009	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		87	74252	AD
7	7-Feb-14	181978	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		64	74253	AD
7	7-Feb-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		59	74254	AD
7	7-Feb-14	636069	2010	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		75	74255	AD
7	7-Feb-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	74256	AD
7	7-Feb-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		76	74257	AD
7	7-Feb-14	181397	2010	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		63	74258	AD
7	7-Feb-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		73	74259	AD
7	7-Feb-14	181497	2011	R-HARRISON R	H-CHEHALIS River H	CDFO		59	74260	AD
7	7-Feb-14	181890	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		59	74261	AD
7	8-Feb-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		72	74217	AD
7	8-Feb-14	90489	2010	UMATILLA R	BONNEVILLE HATCHERY	ODFW	090493,090491,090490,090492	56	74262	AD
7	8-Feb-14	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		79	74263	AD
7	8-Feb-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		59	74264	AD
7	8-Feb-14	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		60	74265	AD
7	8-Feb-14	181976	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		60	74266	AD
7	8-Feb-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		59	74267	AD
7	8-Feb-14	210972	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		62	74268	AD
7	8-Feb-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		72	74269	AD
7	8-Feb-14	181890	2011	R-COWICHAN R	H-COWICHAN RIVER H	CDFO		58	74446	AD
7	8-Feb-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		76	74447	AD
7	9-Feb-14	635693	2010	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	635696	76	74308	AD
7	15-Feb-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		69	74309	AD
7	15-Feb-14	181496	2011	R-HARRISON R	H-CHEHALIS RIVER H	CDFO		57	74310	AD
7	15-Feb-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		67	74311	AD
7	21-Feb-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		59	32977	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
7	21-Feb-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		65	32978	AD
7	21-Feb-14	211015	2011	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		63	32979	AD
7	21-Feb-14	636168	2011	MAY CR 07.0943	WALLACE R HATCHERY	WDFW		54	32980	AD
7	22-Feb-14	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		77	74312	AD
7	22-Feb-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		60	74313	AD
7	23-Feb-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	61	32981	AD
7	28-Feb-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		55	74314	AD
7	4-Mar-14	635696	2010	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	635693	66	74218	AD
7	15-Mar-14	210973	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		76	74219	AD
7	15-Mar-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		84	74315	AD
7	22-Mar-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		56	62269	AD
7	22-Mar-14	635697	2010	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	635698	76	74316	AD
7	28-Mar-14	210912	2009	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	635089	71	74270	AD
7	29-Mar-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	79	74271	AD
7	29-Mar-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	73	74272	AD
7	29-Mar-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		59	74273	AD
7	29-Mar-14	181584	2010	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	181679,181592,181588,181590	NA	74274	AD
7	29-Mar-14	181584	2010	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	181679,181592,181588,181590	80	74275	AD
7	29-Mar-14	211015	2011	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		71	74279	AD
7	29-Mar-14	210950	2010	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA	210977	70	74280	AD
7	29-Mar-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		70	74281	AD
7	29-Mar-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	76	74282	AD
7	29-Mar-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		62	74283	AD
7	29-Mar-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		67	74284	AD
7	29-Mar-14	635369	2009	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		84	74285	AD
7	29-Mar-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		60	74286	AD
7	29-Mar-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		57	74287	AD
7	29-Mar-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		59	74288	AD
7	29-Mar-14	635697	2010	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	635698	70	74290	AD
7	30-Mar-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		90	74291	AD
7	30-Mar-14	210972	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		66	74292	AD
7	30-Mar-14	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		62	74293	AD
7	30-Mar-14	635292	2009	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	635293	79	74294	AD
7	30-Mar-14	635768	2010	PURDY CR 16.0005	GEORGE ADAMS H	WDFW	635767	61	74295	AD
7	30-Mar-14	635282	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	635679	69	74317	AD
7	4-Apr-14	182068	2011	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	182467,181982,180279,182385	67	62270	AD
7	13-Apr-14	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		63	74298	AD
7	26-Apr-14	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		64	62271	AD
7	27-Apr-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		58	74318	AD
7	29-Apr-14	180279	2011	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	182068,182467,181982,182385	65	62272	AD

**Appendix B.3** Coded-wire tag (CWT) recoveries from the 2013-14 winter Chinook MSFs in Marine Areas 8-1 and 8-2.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
81	11/1/2013	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		60	74120	AD
81	11/1/2013	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		50	74119	AD
81	12/14/2013	211004	2011	CLEAR CR 11.0013C	CLEAR CREEK H	NISQ		53	78890	AD
81	1/4/2014	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		63	78891	AD
81	2/7/2014	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		76	74122	AD
81	4/13/2014	211004	2011	CLEAR CR 11.0013C	CLEAR CREEK H	NISQ		56	43061	AD
82	24-Nov-13	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		60	78887	AD
82	1-Mar-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		69	67269	AD
82	8-Mar-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		77	67271	AD
82	8-Mar-14	211015	2011	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		56	74123	AD
82	11-Mar-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		75	74124	AD
82	22-Mar-14	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		65	67274	AD
82	22-Mar-14	211016	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		58	72866	AD
82	23-Mar-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		61	67590	AD
82	31-Mar-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		61	78945	AD
82	5-Apr-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		88	67275	AD
82	12-Apr-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		65	67278	AD
82	19-Apr-14	182068	2011	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	182467,181982,180279,182385	65	67283	AD
82	26-Apr-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		65	72867	AD

**Appendix B.4** Coded-wire tag (CWT) recoveries from the 2013-14 winter Chinook MSF in Marine Area 9.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
9	1-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		64	66934	AD
9	1-Nov-13	210963	2010	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	635695	63	74977	AD
9	1-Nov-13	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		61	78940	AD
9	1-Nov-13	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		56	78941	AD
9	3-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		59	78873	AD
9	9-Nov-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		75	78874	AD
9	9-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		59	78875	AD
9	9-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		69	78876	AD
9	9-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		64	78877	AD
9	10-Nov-13	635587	2010	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		71	78878	AD
9	15-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		60	78879	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
9	15-Nov-13	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		57	78880	AD
9	16-Nov-13	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		58	78881	AD
9	20-Nov-13	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		59	78882	AD
9	21-Nov-13	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		54	66935	AD
9	22-Nov-13	210972	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		68	62734	AD
9	22-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		59	66936	AD
9	22-Nov-13	635283	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		61	78883	AD
9	23-Nov-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		68	66937	AD
9	23-Nov-13	181982	2011	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	182068,182467,180279,182385	59	72857	AD
9	23-Nov-13	636366	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		57	78884	UM
9	23-Nov-13	635769	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		66	78885	AD
9	23-Nov-13	635288	2009	VOIGHT CR TR 10.0428	VOIGHTS CR HATCHERY	WDFW		64	78886	AD
9	23-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		62	87086	AD
9	24-Nov-13	635681	2011	BOYD CR 01.0490	KENDALL CR HATCHERY	WDFW		52	62735	AD
9	24-Nov-13	635683	2010	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	635682	71	78943	AD
9	25-Nov-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		70	78888	AD
9	25-Nov-13	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		58	78889	AD
9	16-Jan-14	635683	2010	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	635682	69	78892	AD
9	16-Jan-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		54	78893	AD
9	16-Jan-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	78894	AD
9	17-Jan-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		52	72863	AD
9	17-Jan-14	211016	2010	GORST CR 15.0216	GORST CR REARING PND	SUQ		57	74121	AD
9	17-Jan-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		52	78895	AD
9	17-Jan-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		57	78896	AD
9	18-Jan-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		56	62736	AD
9	18-Jan-14	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		61	62737	AD
9	18-Jan-14	210998	2011	PALMER HATCHERY	KETA CREEK COMPLEX	MUCK		58	62738	AD
9	18-Jan-14	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		53	62739	AD
9	18-Jan-14	635597	2010	FALLERT CR 27.0017	FALLERT CR HATCHERY	WDFW		70	70836	AD
9	18-Jan-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		58	74812	AD
9	18-Jan-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		51	78897	AD
9	24-Jan-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		54	70837	AD
9	24-Jan-14	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		57	70838	AD
9	24-Jan-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		53	78898	AD
9	25-Jan-14	635899	2010	CASCADE R 03.1411	MARBLEMOUNT H	WDFW	636085	62	70840	AD
9	25-Jan-14	181569	2011	R-BIG QUALICUM R	H-BIG QUALICUM River H	CDFO		67	70841	AD
9	25-Jan-14	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		63	70842	AD
9	25-Jan-14	636096	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		54	78899	AD
9	25-Jan-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		64	78900	AD
9	1-Feb-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		59	67266	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
9	1-Feb-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		57	67267	AD
9	1-Feb-14	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		54	74814	AD
9	14-Feb-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		60	74813	AD
9	15-Feb-14	181570	2011	R-BIG QUALICUM R	H-BIG QUALICUM River H	CDFO		55	62263	AD
9	15-Feb-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		70	62264	AD
9	15-Feb-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		62	62265	AD
9	16-Feb-14	635369	2009	CASCADE R 03.1411	MARBLEMOUNT H	WDFW		84	74815	AD
9	20-Feb-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		68	70843	AD
9	4-Mar-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		62	70844	AD
9	8-Mar-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		57	67270	AD
9	9-Mar-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		68	67272	AD
9	13-Mar-14	636168	2011	MAY CR 07.0943	WALLACE R HATCHERY	WDFW		56	66958	AD
9	16-Mar-14	211004	2011	CLEAR CR 11.0013C	CLEAR CREEK H	NISQ		58	87601	AD
9	21-Mar-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		59	67273	AD
9	22-Mar-14	636099	2011	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW		58	72865	AD
9	5-Apr-14	211011	2011	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ		63	74824	AD
9	5-Apr-14	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		56	74825	AD
9	6-Apr-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		63	74823	AD
9	10-Apr-14	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		65	74822	AD
9	11-Apr-14	210950	2010	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA	210977	79	87153	AD
9	12-Apr-14	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		66	67276	AD
9	12-Apr-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		68	67277	AD
9	13-Apr-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		77	67279	AD
9	13-Apr-14	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		70	67280	AD
9	13-Apr-14	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		82	67281	AD

Appendix B.5 Coded-wire tag (CWT) recoveries from the 2013-14 winter Chinook MSF in Marine Area 10.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
10	19-Oct-13	210958	2010	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		76	78935	AD
10	20-Oct-13	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		50	78936	AD
10	20-Oct-13	636367	2011	PURDY CR 16.0005	GEORGE ADAMS H	WDFW		55	78937	AD
10	20-Oct-13	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		55	78938	AD
10	26-Oct-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		60	78939	AD
10	30-Oct-13	635590	2010	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		66	72812	AD
10	16-Nov-13	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		55	51697	AD
10	24-Nov-13	211013	2011	WHITE R 10.0031	WHITE RIVER H	MUCK		44	72858	UM

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
10	24-Nov-13	636197	2011	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		44	72859	AD
10	24-Nov-13	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		59	72860	AD
10	24-Nov-13	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		52	78942	AD
10	14-Dec-13	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		64	54794	AD
10	4-Jan-14	182068	2011	R-CHILLIWACK R	H-CHILLIWACK RIVER H	CDFO	182467,181982,180279,182385	58	72861	AD
10	5-Jan-14	636197	2011	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		53	72862	AD
10	5-Jan-14	636197	2011	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		52	78944	AD
10	18-Jan-14	635589	2010	ICY CR 09.0125	ICY CR HATCHERY	WDFW		69	54797	AD

**Appendix B.6** Coded-wire tag (CWT) recoveries from the 2013-14 winter Chinook MSF in Marine Area 11.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
11	3/27/2014	636095	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		59	70852	AD

**Appendix B.7** Coded-wire tag (CWT) recoveries from the 2013-14 winter Chinook MSF in Marine Area 12.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
12	12/15/2013	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		62	26166	AD
12	2/1/2014	211005	2011	WHITEHORSE SPRINGS	STILLAGUAMISH HATCH	STIL		57	26167	AD
12	2/1/2014	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		58	56740	AD
12	2/7/2014	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		63	56741	AD
12	2/15/2014	181568	2011	R-BIG QUALICUM R	H-BIG QUALICUM River H	CDFO		70	26169	AD
12	2/15/2014	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		69	26168	AD
12	2/15/2014	635593	2010	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		73	26170	AD
12	4/26/2014	635199	2011	MINTER CR 15.0048	MINTER CR HATCHERY	WDFW		74	87602	AD